

**IOWA'S NONPOINT SOURCE MANAGEMENT
PROGRAM**

2010 ANNUAL PROGRESS REPORT

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Introduction

Nonpoint source (NPS) pollution occurs when rainfall, snow melt or irrigation water runs over land or through the ground, picking up pollutants and depositing them into lakes, rivers and groundwater. Nonpoint pollutants that threaten or impair designated uses in waterbodies originate from both agricultural and urban sources. Such pollutants include: chemical fertilizers, herbicides and pesticides; sediment; bacteria from livestock/pet wastes and faulty septic systems; and oil, grease and toxic chemicals from urban and industrial sites.

Water quality is a direct reflection of watersheds and the land uses. Due to its rich natural resources for production agriculture, Iowa has become one of the most intensively cropped states in the country. While agriculture is not the only source of nonpoint pollution, it is definitely the primary source and the source providing the biggest challenge to address due to the sheer magnitude of the industry.

Addressing agricultural related nonpoint pollution represents not only the physical difficulty of trying to incorporate best management practices over so many acres, but also the challenge of trying to influence landowner attitudes. The agri-industrial complex of today is built upon generations of farmers who have been encouraged to maximize efficiencies mainly in terms of agricultural output.

In addition to the agricultural-related activities, urban runoff and stormwater discharges, atmospheric deposition, onsite residential wastewater disposal and waste disposal practices are causing negative impacts to the water resources of the state. These issues are being dealt with across the state in a variety of ways, through enhanced regulation, statewide information/education programs, and often as a component of a water quality project.

To address nonpoint source pollution, a comprehensive management strategy was developed by the state. Iowa's Nonpoint Source Management Program (NPSMP) dated September 2000, developed in cooperation with a multitude of water quality program partners, identifies Iowa's water resources, the nonpoint source impacts to our resources, and the variety of programs and partners which address nonpoint source issues. In addition, the NPSMP identifies the processes by which resources will be prioritized to ensure the needs of the state are met to the extent possible with the resources available.

The following annual report identifies the progress made during FFY2010 by the state in reaching the priorities and goals set forth by the NPSMP.

Iowa's Nonpoint Source Management Program Vision

Iowa's vision as stated in the Nonpoint Source Management Program (NPSMP) dated September 2000 is:

To preserve and protect the quality of water resources of the state from nonpoint source impairments.

To accomplish this vision, the state will support activities which will:

- increase the public's understanding of Iowa's water quality problems and treatment needs;
- encourage greater public involvement and participation in water quality programs;
- evaluate the status of the state's waters to ensure designated use criteria is being met;
- develop and implement coordinated restoration and water quality improvement plans that help preserve, protect and restore designated uses to surface waters and ground waters that have been impacted by nonpoint source pollution;
- provide technical assistance in the development of surface water and groundwater BMPs;
- promote the adoption of practices that reduce the impact agriculture has on the state's natural resources;
- reduce the impact of nonpoint source pollutants from urban lands;
- support surface water and groundwater monitoring efforts;
- integrate surface water and groundwater quality concerns within basins and watershed to more effectively protect and restore surface water and groundwater uses;
- provide increased opportunities for citizens to participate directly in water quality projects;
- implement measures to protect drinking water from the impacts of nonpoint source pollution; and
- evaluate, update and revise the NPSMP to reflect the most current Section 303(d) list of impaired waters, or every five years as needed.

The following report identifies the specific goals Iowa has established to address the nonpoint source pollution issues of the state and summarizes the activities/projects conducted under each goal in FFY2010.

In FFY2010, DNR began major efforts to update the NPSMP. The DNR Watershed Improvement Program identified two main components needed in the new plan: compiling an inventory of existing nonpoint source programming in Iowa, and developing a vision of Iowa's nonpoint source pollution reduction goals and action steps. As part of the update process, the DNR Watershed Improvement Program began compiling an inventory of DNR programs related to nonpoint source pollution reduction,

and it convened an internal DNR meeting to discuss new DNR nonpoint source program created since the 2000 NPSMP was completed. In 2011, DNR intends to continue gathering nonpoint source program information from partner agency and stakeholder groups to complete the inventory of nonpoint programming Iowa. DNR also plans to facilitate a visioning process that includes nonpoint partner agencies and stakeholder groups to develop the vision component of the updated NPSMP. The updated NPSMP is scheduled to be completed by the end of 2011.

Iowa's Section 319 Program

Overview

Congress added Section 319 to the Clean Water Act in 1987 because it recognized the need to support state and local nonpoint source (NPS) pollution control efforts. The Environmental Protection Agency (EPA), through the Section 319 program, provides grant funds to states to implement NPS pollution control programs and projects.

In Iowa, the designated lead agency for the 319 program is the Iowa Department of Natural Resources (IDNR). The IDNR has received Section 319 funding annually since FFY90. While a portion of Iowa's funding is used to support program administration and implementation activities conducted by IDNR staff, the majority is used to support 3 to 5-year implementation projects conducted by cooperating agencies such as soil and water conservation districts (SWCDs), county conservation boards, universities, and other state or federal agencies or private organizations involved in watershed protection efforts. Projects funded with 319 funding include NPS information and education programs, demonstration of innovative and alternative Best Management Practices (BMPs) for controlling NPS pollution, and implementation of NPS controls in priority watersheds.

Due to the predominance of agriculture in Iowa and the resulting impact of agricultural NPS pollution on Iowa's water resources, NPS control projects are primarily aimed at preventing and reducing agricultural pollutants. However, IDNR has also funded projects that solely address urban concerns or include an urban component, if such is a concern in a targeted watershed. Projects that show a partnership of multiple local, state, and federal agencies, as well as private entities, are strongly encouraged. In addition, all projects must include an information and education component, and the use of new and innovative BMPs is encouraged.

EPA requires the Incremental portion of the state's Section 319 grant to be targeted towards assessing and restoring the impaired waters of the state. Iowa's total Section 319 grant request for FFY2010 was \$4,417,800. The Incremental portion of the FFY10 grant request was \$2,290,500 in FFY2010, with the remaining \$2,127,300 being identified as the Base. The Base award supports the administration of the state program in addition to projects of a statewide nature or those that are designed to protect a waterbody from potential nonpoint impacts.

Application Process

A joint application process is used to obtain NPS water quality implementation project applications for funding consideration under the Section 319 program (administered by IDNR), the state Water Protection Fund (WPF) and the Watershed Protection Program Fund (WSPF) (both administered by DSC/IDALS). Many of the projects selected for funding receive a combination of Section 319, WPF and WSPF, as well as funds from other agencies and private entities.

To be eligible for 319 project implementation funding, applicant watersheds are required to have a DNR-approved watershed management plan (WMP). Since this eligibility restriction does not apply to WPF and WSPF programs, watershed project applicants may apply for WPF and WSPF project funding without applying for 319 funding. The DNR Watershed Implementation Grant provides 319 funding for the project implementation, either solely or jointly with WPF and WSPF matching funds. The DNR Watershed Planning Grant, initiated in 2009, provides funding for local watershed groups to develop WMPs to address impaired waters.

The DNR Watershed Implementation Grant Request For Applications (RFA) and the Watershed Planning Grant RFA were sent January 19, 2010 to all Soil and Water Conservation Districts, county conservation boards, and a variety of other organizations, agencies, and universities. Applications were due April 1, 2010. During 2010, a total of three applications for joint project implementation funding requests (DNR 319 and DSC/IDALS funding combined) were received, totaling \$6,019,756 (including \$4,449,858 in 319 funds), and three additional applications were submitted for 319-only funding, totaling \$1,817,060.

Project applications are reviewed and ranked by an inter-agency review committee based on criteria outlined in the NPSMP. The criteria includes the need for the project, suitability of project measures, budget, comprehensive workplan, potential for success and participation of others. A meeting was held May 26, 2010 with the inter-agency review committee members to meet and discuss individual comments and concerns.

Based on the recommendations of the committee and the department's needs in terms of addressing critical NPS issues, a workplan of proposed projects was developed and submitted to EPA Region VII for final approval on July 30, 2010. EPA Region VII, awarded Iowa's FY2010 Section 319 grant in October of 2010, subject to EPA-approved revisions to project implementation plans and the completion of EPA-approved watershed management plans for selected projects. Upon award of the grant and completion of EPA requirements, contracts are developed with project sponsors and the project activities are initiated.

Commented [R71]: Delete this please

Administration of Section 319 Program

As the state agency having primary responsibility for implementation of Iowa's State Nonpoint Source Management Program (NPSMP), the Department of Natural Resources (DNR) must conduct numerous activities related to implementation of the overall NPSMP and the individual nonpoint pollution control projects being carried out in Iowa.

DNR's responsibilities in implementation of the overall NPSMP include: coordination at a state level of the nonpoint pollution control program and project activities of federal, state, and local agencies; review of federal programs and projects for consistency with the state's NPSMP; and, carrying out a variety of activities essential to implementation of the NPSMP, such as updating the NPSMP to reflect changes in federal and state laws and programs, responding to requests for information and assistance from the public,

developing Section 319 grant applications and project implementation plans, and providing EPA with quarterly, annual, and final reports on the state's nonpoint control programs and projects.

Commented [R72]: Do we really get quarterly reports?

DNR's responsibilities for implementation of individual nonpoint pollution control efforts vary from project to project. For those projects receiving Section 319 funds, DNR's responsibilities are extensive, and include: solicitation and review of project proposals; selection of projects for which funding will be requested and development of grant applications and project implementation plans; negotiation with EPA on project funding; development of contracts or agreements for funded projects; and reporting of project achievements to EPA and the public. In addition, for some projects DNR has specific direct implementation responsibilities.

DNR also provides assistance to local watershed groups to conduct watershed assessments through the use of GIS technology. Assessments include land use assessments, streambank assessments, gully assessments, livestock assessments, and urban assessments. With this assistance, local watershed groups developing plans and implementation projects are able to prioritize and focus efforts to areas and practices allowing for maximum water quality benefits. In addition, using the data obtained through this assistance, actual water quality benefits are more easily documented. The use of visuals produced with the GIS technology provides a tool to educate the public (landowners, concerned citizens, public officials, school children, etc.) regarding watersheds and water quality issues.

Information/education is an integral part of the NPSMP. To support a variety of NPS pollution public information and education activities, Section 319 funding is provided for an Information Specialist position within the DNR. This position assists individual projects with I&E through the development of project brochures, fact sheets, newsletters, and public presentations. In addition, this position is involved in a multitude of statewide NPS I&E efforts, such as an updated watershed improvement program annual report, updates of selected water quality project brochures, legislative presentations, TMDL and Section 303(d) meetings, animal waste issues, etc.

Progress toward achieving goals:

Iowa's NPSMP identifies a number of short and long-term goals, objectives, and strategies to protect the state's surface waters and groundwater from nonpoint source pollution. The progress made during FFY2010 toward achieving these goals is summarized below:

GOAL: To continue and increase water quality protection and restoration on a watershed basis

In FFY2010, the DNR Watershed Improvement Program continued to offer the DNR Watershed Planning Grant, initiated in 2009, as a way to provide financial and technical assistance to local watershed groups to develop a 9-element WMP. Eligibility for the

DNR Planning Grant includes soil and water conservation districts, county conservation boards, cities and counties, and other public and private organizations capable of developing watershed management plans. Watershed eligibility for the DNR Planning Grant is limited to watersheds of 50,000 acres or less in size that drain to an impaired waterbody, in order to target watersheds small enough in size that water quality improvement can be measured. More information about the Planning Grant program is available on the following DNR webpage:

<http://www.iowadnr.gov/water/watershed/planning.html>

Also, DNR continued to offer its Watershed Action Plan guidebook designed as an Iowa-based template for local watershed groups developing a 9-element watershed management plan. The guidebook was based on the EPA Handbook for Watershed Planning. An electronic copy of the guidebook can be found on the Iowa DNR website below:

http://www.iowadnr.gov/water/watershed/files/wmp_guide.pdf

DNR continued to work with several 2009 applicants of 319 watershed projects to serve as early testers (“beta testers”) of the new Iowa Watershed Action Plan guidebook to assess the guidebook’s effectiveness at helping local groups develop 9-element WMPs. Two of the “beta testers” completed 9-element WMPs in 2010, including the Silver Creek Watershed and the Price Creek Watershed, both of which were pre-existing watershed projects. Two other “beta testers” included two applicants which have not yet received funding for watershed projects—the Duck Creek Watershed and the Rapid Creek Watershed. The results of this effort will be the completion of 9-element WMPs for the watersheds above and an assessment of the DNR Watershed Action Plan guidebook.

During FFY2010 two rounds of DNR Watershed Planning Grant applications were solicited, with the first round was due on April 1, 2010. A total of eight applications were received, for a total request in grant funds of \$283,730. Three applications were awarded to develop WMPs for the following impaired watersheds:

- Black Hawk Lake
- Storm Lake
- Swan Lake

The Second round of planning grant applications was due by September 1, 2010. A total of five applications were received, for a total request in grant funds of \$192,580. Three applications were awarded to develop WMPs for the following impaired watersheds:

- Yellow River Headwaters
- Silver Creek
- Badger Creek Lake

Commented [R73]: I have no record of this.

DNR Watershed Planning Grants have also been used to provide additional water monitoring in impaired watersheds where additional monitoring is needed to help determine the specific locations and sources of water quality problems that may be the primary cause(s) of impairment in the watershed. The following impaired watersheds received funding to conduct additional monitoring in 2010:

Waterloo Creek
Lost Island Lake
Otter Creek Lake

Prior to FFY2010, the following watersheds had completed DNR-approved WMP and thereby were eligible to apply for DNR Implementation (319) Grants:

Rathbun Lake
Carter Lake
Lake Hendricks
Williamson Pond

During FFY2010, four 9-element WMPs had been approved by the DNR Watershed Improvement Program. These watersheds include:

- Lyons Creek
- Lake Geode
- Price Creek
- Iowa Great Lakes
- Silver Creek

Commented [R74]: Is that really true? I thought they were not approved yet.

The DNR Watershed Improvement Program partnered with IDALS DSC in 2009 to add an optional water monitoring component to the DSC Development and Planning Grant. Although the DSC Development Grant Program has resulted in useful watershed assessment data for grant recipients, additional water monitoring is often needed to help determine the specific locations and sources of water quality problems that may be the primary cause(s) of impairment in a watershed. For this reason, DNR Watershed Improvement agreed to add a water monitoring supplement to the DSC Development Grant to enable Development Grant applicants to apply for funding from DNR to conduct additional water monitoring, if needed. DNR reviews requests for additional water monitoring on a case-by-case basis, and makes funding decisions based on whether the proposed monitoring plan will help address the potential causes of impairment.

New Watershed Implementation Projects included in the FFY2010 grant application request, were:

- Dry Run Creek
- Lake Geode
- Lyons Creek
- Carter Lake

Section 319 funds support project coordinators, information/education activities and financial incentives for a variety of best management practices (BMPs) to reduce sediment loading from erosion of cropland, streambanks, and construction sites; to reduce nutrient loading from commercial ag and lawn fertilizer, animal and wildlife wastes, and other documented sources; and to reduce bacterial loading from human wastes, animal and wildlife wastes, and other documented sources. BMPs employed include: nutrient and pest management programs, grassed waterways, grass/tree filter strips, wetland restoration, sediment basins, contour farming, pasture and hay land management, critical area plantings, streambank stabilization, stream corridor fencing, alternative watering systems, sinkhole and spring protection, no-till farming, animal waste management structures and grazing management. Urban BMPs like pervious asphalt, rain gardens, and bioswales allow runoff water to infiltrate into the soil in highly developed areas, instead of carrying pollutants directly into receiving lakes, streams, and rivers.

Lake Protection and Improvement Projects: The following are projects to protect and improve the water quality of the lakes listed below:

- Clear Lake Water Quality Protection Project
- Rock Creek Lake Watershed Improvement Project
- Lake Darling Water Quality Improvement Initiative
- Lake Macbride Watershed Project
- Rathbun Lake Special Project
- Storm Lake Water Quality Project
- Brushy Creek Lake Watershed Project
- Viking Lake Water Quality Project
- Infiltration-based Stormwater Management in Iowa's Great Lakes Region
- Prairie Rose Lake Water Quality Project
- Littlefield Lake Nonpoint Source Watershed Project
- Badger Creek Lake Watershed
- Hannen Lake Watershed Project
- Lake Wapello Nonpoint Source Watershed Project
- Mariposa Lake Watershed Project
- Silver Lake Watershed Project
- Union Grove Lake Nonpoint Source Watershed Project
- White Oak Conservation Area Nonpoint Source Watershed Project
- Lake Geode Nonpoint Source Watershed Project
- Williamson Pond Watershed Project
- Lake Hendricks Watershed Project

The following are projects to protect and improve the water quality of the coldwater trout streams listed below:

- Staff and Beaver Creeks Water Quality Project
- South Fork Maquoketa River Water Quality Project
- Burr Oak/Turtle Creek Watershed
- Upper Catfish Creek Watershed Protection Project
- Coldwater Trout Stream Restoration Mini Grant Project

The following are projects to protect and improve the water quality of the warmwater streams listed below:

- Walnut Creek Watershed Quality Improvement Project
- Upper Whitebreast Creek Watershed Restoration Project
- Camp Creek Watershed Project
- Muchakinock Creek Watershed Project
- Jordan Creek Watershed Project
- Clear Creek Water Quality Project
- Price Creek Water Quality Project
- Dry Run Creek Water Quality Project
- Silver Creek Watershed Project
- Fox River Impaired Waters Project
- Nutting Creek Watershed Project
- Tete Des Morts Watershed Project

The following are projects to demonstrate the effectiveness and technical and economic feasibility of construction site erosion control practices and to address water quality issues associated with urban areas:

- Dry Run Creek Watershed Project
- Upper Catfish Creek Watershed Project
- Storm Lake Water Quality Project
- Clear Lake Water Quality Project
- Infiltration-based Stormwater Management in Iowa's Great Lakes Region
- Carter Lake

The following are projects to demonstrate and evaluate Best Management Practices or to provide technical assistance or information on a regional or statewide basis:

- Comprehensive Water and Agricultural Policy Coordination
- Iowa Statewide LiDAR Mapping Project
- Wetland and Coldwater Trout Stream Restoration Mini Grant Project
- Iowa Learning Farm Project
- River Use Survey

Project summaries of the above can be found in EPA's Grants Reporting and Tracking System (GRTS). The summaries provide additional details of the projects, water quality impairments, practices being implemented, funding provided, and project partners. In addition, the Section 319 allocations for each project can be found in GRTS.

Although the projects have been categorized, many of the projects have components of one or more of the other categories, such as many of the lake, coldwater stream or warmwater stream projects address urban NPS issues. All of the projects have an information/education component which includes activities such as: field days, press releases, brochures, demonstration site signs, school and public meetings, etc.

In 2010, the Communications Bureau undertook a number of projects to promote the DNR's Watershed Improvement Section and its efforts.

Working with Communications, the DNR's Watershed Improvement Program continued a marketing effort begun in 2007 to examine the program's strengths and weaknesses. A marketing plan, based on feedback from surveys and focus groups, is helping the program find ways to improve its customer service and grant application process. The two main goals of the marketing effort are to improve both the quantity and quality of applications for 319 grant funding, as well as to increase the demand for DNR assistance with local watershed efforts.

The quarterly e-newsletter, *Clean Water Starts with Us*, continued in 2010. It was developed for current and potential clients (those that have Section 319 funding already and those that could possibly apply). The marketing effort is an ongoing process, with more activities and projects planned for 2011.

The Communications Bureau also developed promotion plans for the DNR Watershed Planning Grants and DNR Watershed Implementation lists, maintaining a list of target audiences and creating e-mail blasts, fact sheets, news releases and more to reach potential grant applicants and encourage them to apply.

Some of the other major activities conducted through the Section 319 information/education staffing support include:

- Developed "Working for Clean Water: 2010 Watershed Improvement Successes in Iowa," an annual publication since 2007 that highlights eight success stories of Iowans improving their streams, rivers and lakes.
- Developed a booklet that takes watershed groups step by step through creating a successful lake watershed effort, with an emphasis on community-based planning.
- Prepared fact sheets, news releases and display materials for TMDL public meetings across Iowa.
- Prepared news releases for EcoNewsWire and for various publications, announcing success stories, pollutant reductions, calls for grant applications, etc.

- Maintained the Watershed Improvement section of the DNR website.
- Created display materials (new overall tabletop display, PowerPoint presentations, handouts, etc.) for conferences, shows and meetings.
- Provided guidance and critiques to watershed project coordinators on newsletters, news releases, websites and other communications products.

Watershed project brochures, and past publications, may be found at the following website: <http://www.iowadnr.gov/water/nonpoint/brochures.html>

GOAL: To protect and restore waters identified by the 1998, 2002, 2004, 2006 and 2008 Section 303(d) list of impacted waters by Nonpoint Source Pollution. TMDLs will be developed and implemented.

During FFY10, TMDLs were submitted and approved for 16 waterbodies and 21 impairments. These are:

Lower Des Moines River (3 Segments), Bacteria
 Beaver Slough, Organic Enrichment
 Cedar River (9 segments), Bacteria
 Cedar Lake, Atrazine
 Ventura Marsh, Algae & Turbidity
 Silver Lake – Delaware, Nuisance Algal Growth, Dissolved Oxygen, pH, Turbidity, & Ammonia

In addition, TMDLs have been completed and submitted to EPA for the following 5 waterbodies and 9 impairments:

Union Grove Lake, Algae, Turbidity, pH, Bacteria
 Silver Creek – Clayton Co., Sediment & Ammonia
 Duck Creek – Scott Co., Bacteria
 Lake of Three Fires, Bacteria
 Big Creek Lake, Bacteria

Development of TMDLs was initiated and/or continued on the following waterbodies:

Dry Run Creek, Biological
 Black Hawk Lake, Algae, Turbidity, Bacteria
 Briggs Woods Lake, Organic Enrichment, Low DO
 Dick Creek, Biological
 Lyons Creek, Biological
 Marrowbone Creek, Biological
 Long Dick Creek, Biological
 Walnut Creek, Biological
 Yellow River (6 tributaries), Low Dissolved Oxygen & Bacteria

Hannen Lake, Algae, pH, Ammonia & Turbidity

The completed TMDLs can be found at the following site:

<http://www.iowadnr.gov/water/watershed/pubs.html>

Watershed Projects were active in the following watersheds to address the impairment(s) identified by a completed TMDL:

- Clear Lake Water Quality Protection Project
- Rock Creek Lake Watershed Improvement Project
- Lake Darling Water Quality Improvement Initiative
- Lake Macbride Watershed Project
- Storm Lake Water Quality Project
- Badger Creek Lake Watershed
- Littlefield Lake Nonpoint Source Watershed Project
- Silver Lake Watershed Project
- Williamson Pond Watershed Project
- Dry Run Creek Watershed Project
- Lake Geode
- Lyons Creek

Additional water quality projects were supported in watersheds of waters listed on the Section 303(d) list of impaired waters, even though a TMDL has not yet been approved. These projects include:

- Rathbun Lake Special Project
- Viking Lake Water Quality Project
- Upper Iowa River Watershed Project
- Whitebreast Creek Watershed Restoration Project
- Tete des Morts Watershed Project
- Muchakinock Creek Watershed Project
- Jordan Creek Watershed Project
- Clear Creek Water Quality Project
- Prairie Rose Lake Water Quality Project
- Prairie Creek Water Quality Project
- Lake Hendricks Water Quality Project
- Dry Run Creek Water Quality Project
- Big Creek Lake Watershed Project

The TMDL Program views public participation as an integral part of improving water quality. It is important to have buy-in from stakeholders, including local citizens, land owners, and other special interest groups, otherwise water quality improvements will be difficult to achieve through a voluntary process. For each TMDL developed, a minimum of two public meetings are held near the impaired water body to promote action from the

local community. The first of these public meetings is to inform the stakeholders that a TMDL is being developed; the second is to present the draft TMDL before it is sent to EPA for approval. Comments received from the public are taken into account when developing and finalizing the TMDL. Press releases are issued through the DNR's EcoNewswire. This weekly press release is sent to approximately 175 press agencies throughout Iowa. In addition, since FFY07, local stakeholders such as County Conservation Boards and Soil and Water Conservation Districts have promoted local public meetings, resulting in higher attendance at public meetings.

Public meetings were held during FFY10 regarding each of the following waterbodies for which TMDLs were being developed:

Big Creek Lake	Dry Run Creek
Lake of Three Fires	Yellow River
Yellow River	Black Hawk Lake
Duck Creek	

Water quality monitoring and assessment is a significant activity in the development of TMDLs. IDNR entered into a contract with the University of Iowa Hygienic Laboratory (UHL) to provide monitoring and assessment services. The following highlights the activities completed for the referenced waterbodies:

Water Quality Monitoring and Assessment, Streams

Base flow (bi-weekly or monthly), event sampling (auto samplers gauged to respond to increased stream stage) and diurnal dissolved oxygen and temperature monitoring (two to three week intervals) was conducted on the following streams:

Willow Creek	White Pine Hollow
Wapsipinicon River	

A variety of chemical analyses is completed, including biochemical oxygen demand, pH, chloride, phosphorus, chlorophyll, dissolved solids, carbon, dissolved oxygen, suspended solids, turbidity, *E. coli*, and nitrogen.

Biological Assessment Sampling of TMDL Streams

Field activities and laboratory sample analysis are conducted for the following impaired section of the identified streams:

Bear Creek	Crane Creek
Pleasant Creek	Little Bear Creek
Middle Fork Grand River	Jackson Creek
Burr Oak Creek	

Field activities include sampling aquatic biota, assessing stream habitat, stream flow, and a variety of field measurements. Laboratory analyses include benthic macroinvertebrate, fish species and water sampling

Water Quality Monitoring and Assessment of Lakes

The following lakes are sampled to collect data used to develop and complete the TMDL:

Volga Lake	Casey Lake
Upper Pine Lake	Beeds Lake
Eldred Sherwood Lake	Avenue of the Saints Lake

The completed TMDLs can be found at the following site:

<http://www.iowadnr.gov/water/watershed/pubs.html>

GOAL: To develop and implement appropriate nutrient management plans on agricultural land in Iowa

Based upon the recommendations of the Nutrient Science Advisory Committee report completed in 2008 (http://www.iowadnr.gov/water/standards/files/nsa_08feb14.pdf), a nutrient standard for recreational use in Iowa lakes has been developed and will be submitted to the Environmental Protection Commission as a Notice of Intended Action at its January 18, 2011 meeting. The rule is expected to be finalized in 2011. This has been a delay from initial projections in an effort to determine the exact lakes to which the standard will apply.

An internal team has been formed to develop a plan of work to develop nutrient standards for Iowa streams. A technical advisory committee will be established to assist with the development process. Information about the work of the team can be found on the DNR website at: <http://www.iowadnr.gov/water/standards/nutrients.html>. The team is expected to produce some initial results by the summer of 2011.

The DNR Watershed Improvement Section worked with researchers at Iowa State University's Center for Agriculture and Rural Development (CARD) in 2008 to develop three grant applications for the EPA Targeted Watershed Grant to investigate nutrient trading and reverse auctions for nutrients contributing to hypoxia problems in the Gulf of Mexico. The applications focus on three separate watersheds: the Boone River watershed, the Raccoon River watershed, and the Walnut Creek watershed, located in Jasper County. EPA announced in December of 2008 that all three TWG applications were approved for funding. Iowa State continues to work on the three grants.

Other Information is available at the Iowa DNR Nutrients and Water Quality Website at: <http://www.iowadnr.com/water/nutrients/index.html>

DNR is working on an update of the Nonpoint Source Management Plan. Considerable thought and effort in the plan will be directed toward addressing the impact of nutrients on Iowa's lakes and streams and developing strategies for addressing those non-point source nutrient concerns.

Individual watershed projects which address nutrient management issues include:

- Lake Darling Water Quality Improvement Initiative
- Lake Macbride Watershed Project
- South Fork Maquoketa River Water Quality Project
- Rathbun Lake Special Project
- Viking Lake Water Quality Project
- Brushy Creek Lake Watershed Project
- Staff and Beaver Creeks Water Quality Project
- Farmers Creek Watershed Project
- Storm Lake Water Quality Project
- Clear Lake Water Quality Protection Project
- Mink Creek Watershed Project
- Camp Creek Watershed Project
- Clear Creek Water Quality Project
- Badger Creek Lake Watershed
- Hannen Lake Watershed Project
- Dry Run Creek Water Quality Project
- Price Creek water Quality Project
- Lyon County Clean Water Demo
- Lake Geode Nonpoint Source Watershed Project

GOAL To restore designated uses in streams/lakes where manure from confined animal operations is causing impairments

High concentrations of ammonia-nitrogen in streams that feed the Raccoon River, the primary source of drinking water for the Des Moines metro area, combined with observations of widespread manure application in February 2008, led to a statewide discussion about the need to limit winter manure application. DNR played a major role in developing a new law restricting the application of manure on frozen or snow-covered ground. The law, Senate File 432, prohibits the surface application of liquid manure on top of snow-covered ground from December 21st to April 1st and on frozen ground from February 1st to April 1st, except in emergencies. The law does not apply to dry manure or manure from small animal feeding operations. DNR is currently in the process of creating rules to enforce this law and field office staff will be tracking instances of emergency application.

The first step towards addressing manure issues is to determine where livestock and poultry facilities are, how many animals they have, and what their current manure storage and management practices are. DNR has recently developed two web applications that

allow the public to search animal feeding operation data by watershed and view the history of permits, inspections, and complaint investigations at these facilities. These applications are the Animal Feeding Operations database and the Field Office Compliance database. Staffing for compliance and enforcement of confinement animal feeding operations has been drastically cut this year, so DNR will need the public's help to assure compliance with state regulations. These databases will also allow producers to access information about their permits and should reduce the time that staff spend answering questions about due dates and records. To make the best use of staff time, DNR is also piloting a project to concentrate enforcement efforts in priority watersheds.

Commented [R75]: Which watersheds are priority?

DNR has worked to encourage voluntary improvements to manure management across the state through the funding and technical support for watershed projects and educational efforts. For example, DNR staff have assisted with mapping, sampling, and coordination of the Brushy Creek Watershed project led by Des Moines Water Works and funded by WIRB (the Watershed Improvement Review Board). DNR staff are also working with federal and state agencies, university, and industry partners to develop a coordinated program to address the water quality impacts of small open feedlots.

Projects such as the Statewide Manure Management Education Initiative provide information and education programs to producers and service providers to assist in the making of appropriate decisions about the utilization of manure and manure nutrients. Programs such as the Iowa Manure Management Action Group (IMMAG) and the Iowa State University Extension Manure and Nutrient Management Workshops are supported through this project and have proven successful through the numbers of attendees, hits on the web sites, and copies of requested newsletters.

Individual watershed projects which address animal waste issues include:

- Storm Lake Water Quality Project
- Lake Macbride Watershed Project
- South Fork Maquoketa Watershed Project
- Brushy Creek Lake Watershed Project
- Viking Lake Water Quality Project
- Staff and Beaver Creeks Water Quality Project
- Farmers Creek Watershed Project
- Jordan Creek Watershed
- Badger Creek Lake Watershed
- Price Creek Water Quality Project
- Hannen Lake Watershed Project
- Silver Creek Watershed Management
- Lyon County Clean Water Demo
- Silver Lake Watershed Project
- Tete Des Morts Watershed Project
- Lake Geode Nonpoint Source Watershed Project
- Williamson Pond Watershed Project

GOAL: To implement stormwater programs to reduce NPS impacts from stormwater and construction site runoff

The Urban Stormwater Management project has successfully provided outreach to MS4 city elected officials and staff, developers, contractors, and builders. Such things as the development of a model post-construction stormwater ordinance, the maintenance of the Iowa stormwater website (iowastormwater.org), meetings with stakeholders, the development of a SWPPP checklist to be used by MS4 communities, and technology transfer of erosion and sediment control design standards and specifications have raised awareness about stormwater. Other state agencies such as the Department of Economic Development and the Department of Agriculture and Land Stewardship are incorporating improved stormwater management into their programs and staffing. In addition, DNR staff is implementing the storm water program strategy at the Department field office level.

Ongoing individual DNR sponsored and funded projects which address stormwater and construction site runoff include:

- Storm Lake Water Quality Project
- Clear Lake Enhancement and Restoration Project
- Lake Macbride Watershed Project
- Upper Catfish Creek Water Quality Project
- Infiltration-Based Stormwater Management in Iowa's Great Lakes Region
- Assessment and Management Plan for the Iowa Great Lakes Watershed
- Dry Run Creek Sub-Watershed Retrofit and Bank Stabilization Project
- Silver Lake (Palo Alto)
- Carter Lake

Iowa State University's Center for Transportation Research and Education completed design standards for post-construction storm water quality best management practices. The standards are included in an updated version of the Iowa Stormwater Management Manual (ISMM) (formerly called Statewide Urban Design and Specifications (SUDAS) Manual) and are being funded with storm water permit fees. A web link to the design guidelines are posted on the web at:
<http://www.intrans.iastate.edu/pubs/stormwater/index.cfm>.

Because the specifications related to the standards in the ISMM were not completed in the earlier work, DNR is negotiating with ISU to complete the specifications section by April 1, 2010. The cost of the specifications development will be funded from sources other than Section 319.

Storm water permit fees in the past have been used to support other DNR programs in addition to storm water. Because the State Legislature provided DNR with additional

funding in the 2009 session additional field office staff will be supported for storm water enforcement work.

The Legislature provided the DNR with I-Jobs (state bonds) money this year and DNR will utilize \$1.425 million to support urban post-construction storm water best management practices through a process that will include a request for proposals. The RFP is expected to be posted in the late fall of 2009 and most of the practices to be funded are expected to be completed in 2010. The ISMM must be followed to qualify for funding.

The federal American Reinvestment and Recovery Act provided significant funding for Iowa's state revolving fund and much of that went to cities for implementation of improved urban storm water practices.

All of the various Iowa storm water individual and general permits can now be accessed on the web at: <https://facilityexplorer.iowadnr.gov/FacilityExplorer/Default.aspx>

NPS Pollution on Urban Landscapes

Efforts have been underway to develop urban conservation services in Iowa for over ten years. After a slow start, progress is now being made. Past efforts were primarily funded by the 319 program and featured strong educational programs and demonstrations of Best Management Practices. Efforts have shifted to specific watershed treatment projects and are increasingly being funded by money from state programs.

Current efforts focus on improving erosion and sediment control on construction sites and managing storm water runoff for water quality protection. Storm water strategies have featured infiltration-based practices that manage the water quality volume (or runoff from up to 1.25") of rain. Stabilization of urban stream corridors is becoming another priority.

In 2008 a major advance in urban conservation occurred by the creation of five urban conservationist positions within the Iowa Department of Agriculture and Land Stewardship. Four positions are located in Soil and Water Conservation Districts (Pottawattamie, Dickinson, Polk and Johnson SWCD). One position is in the Central Office of IDALS's Division of Soil Conservation.

The other significant step that occurred in 2008 was the adoption of local stormwater ordinances that require the management of the water quality volume through infiltration-based BMPs for all new development. These ordinances were adopted by the cities of Okoboji, Spirit Lake, Wahpeton, and by Dickinson County, all of which are located wholly or partly within the Iowa Great Lakes watershed, where two 319-funded projects have been ongoing. These two projects included the Iowa Great Lakes Assessment Project and the Iowa Great Lakes Infiltration Project. Also in 2008, Dubuque County adopted a Low Impact Development ordinance for new development, largely due to the educational and demonstration activities conducted by the 319-funded Upper Catfish

Commented [R76]: This report is for the 2010 FFY, so this should be updated, correct? Please update anything else throughout the report to include all activities through September 30, 2010.

Creek Watershed Project. It is expected that the institutionalization of stormwater management for water quality protection will continue to result from the educational programs and BMP demonstrations that were funded by the 319 program in recent years.

The counties that had or currently have established urban conservation projects include: Dubuque County, Scott County, Johnson County, Jefferson County, Linn County, Black Hawk County, Buena Vista County, Dickinson County, Polk County, Story County, Pottawattamie County and Mills County. Wapello and Warren Counties are in the process of starting up urban projects.

GOAL: To reduce NPS impacts from on-site wastewater treatment systems

Improving private on-site wastewater systems is an essential step in improving water quality in Iowa. It is estimated that Iowa currently has up to 300,000 private septic systems and as many as one-third of those may be inadequate in terms of treatment effectiveness.

The Onsite Wastewater Training Center of Iowa continues to operate and provide training to county sanitarians, onsite installers, engineers and others in the onsite wastewater industry. The training center was developed with the assistance of a Section 319 grant for technical assistance and training. The center has been in operation since 2005 and has given 66 classes to more than 2000 participants since its inception. In 2009, nine classes were given and two additional displays were added. The Training Center continues to provide quality education to sanitarians to improve the quality of septic systems used in Iowa. Additional information can be found at www.wastewatertraining.com.

In 2008, the Iowa Legislature passed a statewide requirement for time of sale septic system inspections. Beginning July 1, 2009 this law took effect. Every building with a septic system must have that system inspected prior to the transfer of the deed for that property. The time of sale is the most advantageous time to inspect and upgrade systems since money is already changing hands for the sale of the property. The inspection is primarily a method to discover the estimated 100,000 inadequate septic systems in Iowa. When an inadequate system is discovered during inspection it is required to be repaired or replaced. The inspections are conducted by a state certified inspector to ensure consistency and the results of these inspections are provided to the county environmental health offices for any required follow-up. Since the program began, an estimated 9000 inspections have been conducted and 2500 inadequate systems have been replaced with new code compliant systems. Additional information can be found at www.iowadnr.gov/tot.html.

Iowa's septic system regulations were updated in 2009 to include the previously mentioned time of sale inspection and to address improvements and innovations in the onsite industry. Iowa Administrative Code (IAC) 567 – Chapter 69, "Private Sewage Disposal Systems" now includes new technologies such as textile and peat filters to provide more options to properly treat wastewater on restrictive lots. Septic tank lids

must be brought to the surface and effluent screens are now required to promote management of onsite systems. Many other changes were made to enhance system management and performance. Additional information can be found at:
<http://www.legis.state.ia.us/aspx/ACODOCS/DOCS/567.69.pdf> .

The State Revolving Loan Fund to support the replacement or upgrade of outdated private septic systems has now distributed more than 1000 loans for a total of over \$7 million. The program provides low interest loans for homeowners to update inadequate septic systems. Additional information about this program can be found at:
www.iowadnr.com/water/srf/onsite.html.

Individual watershed projects which address onsite wastewater treatment systems include:

- Lake Macbride Watershed Project
- Lake Darling Water Quality Improvement Initiative
- South Fork Maquoketa Watershed Project
- Mink Creek Watershed Project
- Brushy Creek Lake Water Quality Project
- Viking Lake Water Quality Project
- Silver Lake Watershed Project
- Silver Lake (Dickinson) Watershed Project
- Lyons Creek Watershed Project

GOAL: To protect waters of the State through installation and/or establishment of buffers and other riparian area improvements and through restoration and enhancement of wetlands

Past projects have specifically promoted the installation or establishment of buffers or wetlands. During the FFY10, these practices were promoted through individual watershed projects. Individual watershed projects which promote the installation of buffers and/or wetlands include:

- Clear Lake Enhancement and Restoration Project
- Rock Creek Lake Watershed Project (Jasper County)
- Lake Macbride Watershed Project
- Storm Lake Water Quality Project
- Camp Creek Watershed Project
- South Fork Maquoketa Watershed Project
- Viking Lake Water Quality Project
- Rathbun Lake Special Project
- Brushy Creek Lake Watershed Project
- Staff and Beaver Creeks Water Quality Project
- Muchakinock Creek Watershed Project

- Farmers Creek Watershed Project
- Badger Creek Watershed Project
- Jordan Creek Water Quality Project
- Clear Creek Water Quality Project
- Hannen lake Watershed Project
- Union Grove Lake Nonpoint Source Watershed Project
- Prairie Rose Lake Water Quality Project
- Dry Run Creek
- Water Quality in Rathbun Lake: BMPs for Targeted Sub-Watersheds 2008
- Tete Des Morts Watershed Project
- Trumbull Lake Watershed Project
- Hickory Hills Watershed Project
- Silver Lake (Dickinson)
- Big Creek Lake
- Kiowa Marsh Restoration Project
- Wetland Restoration Mini Grants

GOAL: To ensure 85% of the Iowa citizens are served by water systems with source water protection (SWP) programs and to achieve implementation of SWP plans for Public Water Supplies that will ensure 85% of the Iowa citizens are served by water systems protected by a SWP plan

The Iowa Department of Natural Resources (IDNR) Source Water Protection (SWP) Program incorporated the EPA Watershed Based Approach (WSBA) in late 2007-2008. The approach is basically: identify the problem, identify the source of the problem, and implement practices to decrease the risk to drinking water sources. This approach is incorporated into a living document called a “Source Water Protection Plan”. This new approach was initiated in an effort to develop SWP plans that Iowa communities can implement to decrease risk to their source water. A review of past contractor-developed SWP plans showed that few of the 200-plus contracted plans were readily accessible to the communities, and those that were accessible did not provide information regarding the contaminant risks or practices that would address risks to Iowa communities’ source water. Therefore, these previous SWP plans yielded little positive impacts for the communities for which SWP plans were developed.

For many reasons it was strongly felt that a revised approach was needed for the IDNR SWP program. The EPA WSBA includes adequate ground water assessments that can identify risks, the source of those risks, and the practices that can best address those risks for highly susceptible Community Water Supplies (CWSs). Because the SWP resources were/are limited, the program needed to set priorities in order to best serve Iowa CWSs. A departmental SWP technical committee was developed in 2006. The members include IDNR staff from: Water Supply Engineering, Water Supply Operations, Water Monitoring, Watershed Improvement, Geological Survey, Environmental Services Division-Field Services, Contaminated Sites and Leaking Underground Storage Tank sections. The SWP technical committee set nitrates as the primary SWP criteria as it has a

Maximum Contaminant Level (MCL) and there are land use practices that can be implemented to decrease this risk. In 2006 the program utilized IDNR state water monitoring data to prioritize CWSs who are most susceptible to Point (PT) and Non-Point Source (NPS) contamination from land use practices. Of the nearly 900 CWSs in Iowa, 228 of these met the SWP technical committee's criteria. A "top 40" list was then derived from the list of 228.

The SWP Technical Committee developed SWP Planning Criteria to assist communities in the SWP planning process. The criteria incorporate the WSBA by including direction for forming a locally led SWP Community Planning Team, conducting SWP Assessments, identifying source water problems and their sources. In addition, partnering with local, state, and federal agencies to identify Best Management Practices (BMPs) to address the identified problems is included.

The SWP Program developed a database in-house in early 2007 to support the SWP program. The database was not a cost to the SWP Program other than the SWP Program staff's time. The database is utilized by the SWP program, IDNR staff, USDA-NRCS, FSA, Iowa Dept. of Agriculture & Land Stewardship Division of Soil Conservation, CWSs, consultants, IRWA, IAMU, local citizens, and local Soil & Water Conservation Districts, among others. The database provided information regarding CWS's well logs, SWP Reports, SWP Plans, Sanitary Surveys, among other data. This database is available on-line and is easily accessible.

In 2008 the SWP Program initiated five SWP Pilot Projects that incorporated the WSBA. The five pilots were selected from the "top 40" priority list. The pilot projects organized SWP community planning teams, conducted ground water assessments and developed SWP work plans. The project plans include practices for reducing risk to the water supply. These pilot projects were initiated by the IDNR SWP program and in 2008 included the following agency partners: USDA- NRCS (both state and local office), USDA-FSA (both state and local office), USDA-ARS (Ames), USDA- Resource Conservation and Development, Iowa Dept. of Agriculture and Land Stewardship (IDALS) Division of Soil Conservation, local Soil and Water Conservation Districts, IDNR Contaminated Sites Section (CSS), IDNR Water Supply (WS) Section, IDNR Geological Survey Section, IDNR Water Monitoring (WM) Section, IDNR Field Services, IDNR Leaking Underground Storage Tanks (LUST) Section, IDNR Private Lands Biologist, and Watershed Improvement (WSI) Section. SWP pilot projects have expressed gratitude to the IDNR for the ground water assessments and planning assistance conducted through the SWP program.

The Pilot Projects identified the following CWSs needs: basic SWP outreach and information regarding defining SWP, how SWP affects the sustainability of a CWS and SWP capture zone description. In addition, explanation of the following health concerns: nitrates, bacteria and benzene in drinking water sources. In addition, a viable SWP ground water assessment is needed to identify the source of contaminants to determine BMPs for protecting CWSs in highly susceptible communities. Within the one year period the pilot projects were conducted, the following positive impacts were made:

- CWSs became actively involved in their SWP planning
- Application from CWSs for Drinking Water State Revolving Fund (DWSRF) loans for land purchase of “critical” land identified by SWP ground water assessment
- Leopold grant application for a CWSs that will result in a 3 year study for changing land use to decrease risk to the CWSs
- CRP enrollment in pilot project area
- Application for state WIRB grant for protecting critical source water areas
- USDA-NRCS actively involved in developing land use practices for identified priority areas
- USDA-FSA actively involved in accessing SWP DB to assist land owners in SWP-CRP eligibility
- Communities attending the stakeholder meeting in the Wallace building to support the 2008 SWP Criteria, many from both sides of the state as well as the Des Moines area
- CWS is utilizing the SWP ground water assessment in applying for WIRB Grant
- Iowa was selected by EPA to receive, in 2009, SWP Outreach Workshop grant

Ground water assessments in the SWP pilot projects are critical to identifying the areas that are susceptible to contamination. A surprising addition to this is the realization that CWSs do not actively get on-board until the ground water assessment is conducted. As a result of a viable ground water assessment, these CWSs are now willing to provide their time, energy and funding to protect the area that is clearly defined by the assessment. In addition, pilot projects have expressed gratitude to the IDNR SWP program for assisting them with decreasing risk to their CWS. Some CWSs have contacted their legislative representatives to voice their positive experience with the IDNR approach to protecting their source water and aiding their CWS in remaining sustainable.

Individual watershed projects which address source water protection include:

- Rathbun Lake Special Project
- Storm Lake Water Quality Project
-
- Iowa Great Lakes Assessment Project

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Agriculture Drainage Wells:

The Groundwater Protection Act passed by the Iowa General Assembly in 1987 and SF 473 passed by the General Assembly in 1997 provided important safeguards to prevent the degradation of Iowa’s groundwater and made significant changes in how the State addresses agricultural drainage wells (ADW). Among other things, the two pieces of legislation required that all ADWs be registered with the DNR, that a plan for proposed alternatives be prepared, and surface intakes for all ADWs be removed and their cisterns sealed.

Following up on the legislation, in 1997 the DNR promulgated rules that required ADWs to be permitted in order to maintain their continued use. The permits contain a number of

requirements including the removal of any septic system to the ADW or to tile lines that drain to the ADW and the removal of all surface intakes. An ADW permitting database is maintained by the DNR Water Supply Engineering Section. Funding for the ADW improvements required in the permits was provided by USDA/NRCS through the Environmental Quality Incentive Program (EQIP). Funding for ADW closure and alternative drainage as well as information and education has been and continue to be provided through the Iowa Department of Agriculture and Land Stewardship (IDALS). IDALS is currently seeking new applications for closure assistance.

To the credit of the well owners and the various agencies involved, less than 90 of the original 200-plus ADWs remain in use.

Ten-year continued use permits for agricultural drainage wells (ADW) began to expire in 2009. Staff from DNR Field Office #2 in Mason City visited and inspected each well that DNR records indicated were still in operation. DNR had determined that 50 wells would need inspections and new permits. The following has taken place:

- 18 of the 50 were identified/confirmed as closed.
- 22 of those have been renewed.
- 3 more will be renewed in January 2010, once the public comment period expires.
- Six (6) have remedial work to do before a permit will be renewed.
- One (1) has just been 'selected' for formal compliance action.

Commented [R78]: Please update this.

55 ADWs have permits that will expire in 2010. DNR has already confirmed/verified that 10 of those have already been closed. More closures are expected with assistance from an IDALS closure program in the next 12 months. Inspections will be completed on the remaining wells to ensure compliance before a new permit is issued.

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APPENDIX A

Successful projects in 2010

FARMERS CREEK WATERSHED PROJECT



This project officially ended in FY2010 and is definitely a success story for the state of Iowa. This watershed is scheduled to be removed from the 2010 impaired waters list for the aquatic life impairment. Recent biological data suggests that Farmers Creek Index of Biological Integrity score is no longer below the ecoregion standard for benthic organisms. Below is a portion of the final report submitted to us during FY2010.

The Stream Profile

Farmers Creek is located in the heart of Jackson County, Iowa. The stream originates in Prairie Springs Township, north of the town of LaMotte and meanders for seventeen miles southward until it empties into the Maquoketa River near the village of Fulton. Farmers Creek is classified as a warm water stream, although temperature monitoring by the watershed project and the DNR fisheries determined that the upper one third of the creek could be considered a cold water stream due to the average summer temperature of 62 degrees Fahrenheit. Local uses of the creek include fishing and swimming by private owners. There are no public facilities along this stream.

Monitoring data warranted placing Farmers Creek on Iowa's 303(d) List of Impaired Waters in 2002. The monitoring was conducted by the Iowa Department of Natural Resources (IDNR) and the Long-Term Resource Monitoring Program. The data generated from the samples collected indicated that Farmers Creek contributed more sediment and phosphorus than 14 of 16 other Maquoketa tributaries. During the late 1990s, two fish kills occurred within a three year period, killing an estimated 137,200 fish. These kills were attributed to high levels of ammonia and Biochemical Oxygen Demand (BOD) from an animal feeding operation and a dairy farm. The assessment results in the 2000 Water Quality in Iowa report stated that the Class B aquatic life uses were "not supported". DNR research reports "low fish community diversity and less than a majority of the expected fish taxa (4 of 9).

The Farmers Creek Watershed is a component of the Maquoketa River Subbasin. The Jackson County Soil and Water Conservation District, a partner in the Maquoketa River Alliance (MRA), identified the Farmers Creek Watershed as a priority subwatershed in this region. Starting in 1996, the MRA began collecting high flow water samples within the Maquoketa River Basin, identifying Farmers Creek as major contributor of significant amounts of sediment and nutrients to the Maquoketa River System.

The MRA and associated groups planned to address the problems of nonpoint source contributions of suspended solids and nutrients in the watershed. However, the alliance disbanded for lack of funding. Their project was funded through the Jones County Soil and Water Conservation District, contracted to Limestone Bluffs RC&D in Jackson County, with the main goal of dispersing information and education to the residents of the Maquoketa River Subbasin.

Farmers Creek is scheduled to be removed from the impaired waters list in 2010!

Watershed Characteristics

The Farmers Creek Watershed encompasses 30,590 acres of rolling farmland and bluffs in the center of Jackson County, Iowa. According to the Natural Resources Conservation Service (NRCS), 86 percent of the watershed is classified as Highly Erodible Land (HEL) due to steep topography and soil characteristics.

Land in the watershed is owned primarily by farmers, and managed for crop and livestock production. There are 150 landowners in the rural watershed area and about 272 urban residents in the village of LaMotte, according to the 2000 census. Nineteen businesses have been identified in town, the most prominent being the feed store, filling station, Circle C Saloon, and an implement dealer.

The estimated pre-project and pre-assessment land use for the Farmers Creek Watershed (2002) is shown in Table 1:

Table 1

Land-use Class	Acres	Percent of Total
Corn	8,831	28.8%
Soybeans	2,575	8.42%
Grass/Hay	13,028	42.6%
Timber	5,760	18.8%
Water	18	.06%
Urban	354	1.16%
CRP	2,941	9.6%

Land uses in the watershed are divided primarily between crop ground, pasture and timber. Only two percent of the land is non-agricultural. There are approximately 11,406 acres of crop land in the watershed, with corn/bean rotations and corn/bean/hay rotations being the norm. The majority of farms are owner operated. Pasture and hay ground account for about 13,028 acres in the watershed

At the beginning of this project, there were about 2,941 acres in the Crop Reserve Program (CRP). However, due to the economic incentives to plant corn and expiring contracts, the watershed has seen a reduction in CRP acres over the past four years, with total numbers nearer to 2,200 acres. A review of the NRCS files for the agricultural

landowners reveals that at least 98 percent of the farmers have a conservation plan and are in compliance according to Farm Service Agency (FSA). Early in the project, the trend to increase soybean production had many producers updating their plans and increasing the number of no-till acres.

. In 2004, there were approximately 32 beef producers, 5 dairy farms, three swine producers and two sheep facilities. Approximate livestock numbers at that time included 6,000 beef cattle, 2,000 dairy cows, 1000 hogs and 80 sheep. There was also one alpaca operation. The livestock in this watershed are typically allowed to graze in pastures where streams are the only source of water. This has resulted in increased stream bank erosion and increased water turbidity.

There are approximately 5,760 acres of timber and pastured forest in the watershed. The woodland species typical of this area are red and white oaks, hard maples, hackberry, basswood, walnut, black cherry, red elm and white elm. These forested areas are typically located along steep drainage areas and around bluffs and limestone outcroppings. Gully erosion is the most significant problem within the timber, compounding the sediment delivery to the stream. Five hundred and ninety-six acres are enrolled in the Forest Reserve Program.

Soils and topographic characteristics: The watershed lies in the Southern Iowa Drift Plain landform region, on the edge of the Paleozoic Plateau. This gently sloping to very steep terrain is characterized by dolomitic limestone bedrock escarpments rising above the valleys. The abundance of surface and exposed limestone makes the region useful for quarrying. Most of the soils in this area are included in the Fayette-Nordness-Rock Outcrop Association, with the perimeter of the watershed in the Downs-Fayette association. Minor soil types in this association are the Chaseburg, Rozetta, and Tama soils. Slopes range from 2 to 60 percent. Typically, the surface layer of the Fayette soil is brown silt loam, about 8 inches thick. The surface layer of the Downs soils is very dark grayish brown silt loam and about 7 inches thick.

Type, Distribution and Intensity of Pollution Sources

Nutrients and sediment delivery were identified as the primary nonpoint pollution concerns in the watershed by the landowners and DNR Long-Term monitoring. A watershed assessment survey was sent to 154 landowners in 2004. Thirty percent of the landowners responded, identifying sheet, rill and gully erosion as their main concerns, with stream bank erosion the main concern for those owning creek front property. During years of average rainfall, the IDNR determined that the Farmers Creek Watershed loses an estimated 11.6 tons of soil per acre. The potential sediment delivery for a single 2 inch rain event has been calculated to be 21,744 tons per event. This creates the potential for 355,134 tons of soil to be lost within this watershed in a single year. The ongoing flow of soil particles into the creek has affected aquatic habitats and fish populations. The steep terrain and karst topography of the area exacerbate soil loss and subsequent sediment delivery to the stream.

Monitoring of turbidity levels by the IDNR and Limestone Bluffs RC&D during the years 1996 through 2002 produced samples that ranged from 62 to 2021 ntu (Nephelometric Turbidity Units) during high flow periods. The average turbidity level, based on 11 samples, was 883 ntu.

Livestock waste and runoff from land applied dairy manure were suspected to have caused several fish kills and resulted in a downgrading of the Class B (LR) uses from “partially supported” to “not supported”. Monitoring by IDNR since 1996 revealed significant levels of nitrogen and phosphorus. The levels of nitrogen ranged between 4.1 and 12.37 mg/l. The phosphorus levels in the samples ranged between .19 and 2.98 mg/l. The watershed survey indicated that 98 percent of the producers did not have nutrient management plans. Most, however, did indicate that they tested their soils before applying nutrients. Fertilizers are most commonly applied in the spring, and dry fertilizer was the preferred form.

Bacterial levels in the stream were also monitored by Limestone Bluffs RC & D, with very high levels of fecal coliform bacteria being found. Samples were taken from four locations in the watershed. Data provided in Table 2 by Limestone Bluffs was collected in August of 2002.

Collecting site	Fecal Coliform Bacteria
FC 1	60,000 cfu/100 ml
FC2	230,000 cfu/100 ml
FC 3	30,000 cfu/100 ml
FC 4	200,000 cfu/100ml

Project Objectives and Practices Needed to Protect Water Quality

The Jackson Soil and Water District Commissioners and the District Conservationist for Natural Resources Conservation Service (NRCS) approved the following project objectives:

- Reduce the amount of sediment delivery to Farmers Creek by at least 40 percent.
- Reduce the amount of nutrient flow to the creek by at least 40 percent.
- Provide information and educational programs to landowners and residents by hosting field days, tours, and demonstrations, and to keep the public informed of water quality issues through newspaper articles and radio announcements.

Best Management Practices (BMPs) selected for the project were based on their effectiveness to reduce soil and nutrient delivery to the stream. Assuming funding, time, and stakeholder participation were unlimited, a summary of BMPs needed to address the water quality issues in Farmers Creek is shown in Table 3:

Table 3: Best Management Practices Needed to Protect Water Quality

BMP	Amount/Units Needed
Sediment Control:	
Grassed Waterways	330 acres
Filter strips	317 acres
Contour Buffer Strips	1,230 acres
Riparian Buffers	340 acres
Grade Stabilization Structures	90
Water/Sediment Control Basins	180
Stream bank Stabilization	36,000 feet
Nutrient Management:	
Animal Waste System	25
Feedlot Diversions	35
Livestock Exclusion	172 acres
Manure Management Plans	35

Additional practices and goals, listed below, were included in the original grant proposal. There seemed to be no interest by landowners in manure exchange, and no-till has been implemented by many of the landowners for the economic, labor, and conservation benefits, without the aid of incentive payments. The timber stand improvement and tree establishment practices had funding through other programs, mainly EQIP, and were not considered to be high priority items.

- Manure Exchanges
- No-till incentives on 2,500 acres
- Timber Stand Improvement on 750 acres
- Tree/Shrub Establishment on 150 acres

Critical Areas: The Farmer Creek Watershed Project attempted to identify and focus on critical areas in the watershed which were having the greatest impact on water quality. By concentrating on the critical areas, project resources would be used in the most efficient and cost effective manner. The critical areas included:

- Areas where livestock had direct access to the stream
- Sharp turns along the stream that accelerate streambank erosion
- Steeply sloped fields being planted with conventional tillage
- Ephemeral gully erosion.

Table 4: Conservation Practices and Project Goals for Implementation
(Assuming limited funding and a three year time period)

BMP	Three Year Goal
Grassed Waterways	45 acres
Animal Waste Systems	5 units
Grade Stabilization Structures	30 units
Water/Sediment Control Basins	25 units

Streambank Stabilization	9,000 feet
Riparian buffers	30 acres
Tree/shrub establishment	150 acres
Timber Stand Improvement	750 acres
Filter Strips	150 acres
Contour buffer strips	200 acres
No-till incentive	2,500 acres

Project Planning and Organization

The initiative to research the possibility of a new watershed project in the county was spearheaded by District Conservationist Ed Andrews and the Soil and Water Conservation District Commissioners. On January 21, 2004, Regional Watershed Coordinator Jeff Tisl spoke to the Commissioners and NRCS staff, offering his assistance in generating a new watershed project. The Commissioners then chose Farmers Creek for the next project due to the fact that it was on Iowa's 303(d) list of Impaired Waters. The following nine months were used by district employee Michelle Turner to research the watershed, conduct surveys, and write the grant.

A plan of work was developed each year to guide and direct the activities of the watershed project and to track the attainment of set goals. The following work items were established:

- 1. Administer Project and Implement all Activities and Goals in the Farmers Creek Watershed Project.** The project was successfully administered by the project coordinator through effective coordination with the SWCD Commissioners, NRCS staff and IDALS staff. Reports were prepared and submitted on a monthly, quarterly, and annual basis, and including special reports needed on BMP locations and sediment reductions. An annual review meeting was conducted at the end of each fiscal year to assess progress and modify goals. To assure effective project leadership, the project coordinator attended training sessions as needed.
- 2. Complete the Assessment Process and Watershed Planning to Identify Critical Areas, Focusing on Resources and BMP Implementation.** A land use survey using the DNR supplied computerized notebook was conducted during the first year of the project. In the second year, a Rapid Assessment of Stream Corridor Along Length (RASCAL) was completed, and maps were generated by DNR to help identify critical areas. The Farmers Creek Watershed was a pilot program for both assessments. In retrospect, these surveys would have been more valuable if they had been conducted before the writing of

the project grant, allowing for a more accurate estimation of needed BMPs. Water quality was monitored on a monthly basis utilizing IOWATER sampling and testing procedures.

3. Install BMPs, focusing on identified critical areas using GIS, with special consideration for highly visible areas in year one. Over 100 conservation practices were completed over the four year project period. Although this is impressive, the real value of these practices is revealed when examining the sediment delivery reduction, which met the intended goal established in the original grant.

4. Conduct Informational and Educational Activities to Generate Additional Interest and Build Support, Focusing Primarily on the Livestock Issues and the Threat They Pose to Water Quality. A quarterly project newsletter promoted best management practices and cost-share options, and featured articles about completed projects in the watershed that had a positive effect on water quality. News releases were published at least bi-monthly in local newspapers and frequently broadcast on KMAQ radio. Yearly field days were highly attended and resulted in the implementation of practices that could be traced to these demonstration events. With the cooperation of IDNR, an eight page brochure detailing the project was designed and distributed.

BMP Implementation

The selection of BMP projects were guided by the findings of the RASCAL, with priority given to sediment and nutrient reducing practices found within the critical areas. Cost share was offered primarily through WSPF and 319 funds. To stretch the watershed funding, expensive practices such as stream bank stabilization and grade stabilization structures were piggybacked with EQIP. To insure funding, EQIP applicants were given bonus points for being located within the watershed. All projects received up to 75% cost share, with the remainder being the responsibility of the landowner. Low interest loans were available to landowners to handle their payment obligations. Other alternative cost share resources used included WIRB, CRP and REAP. In some instances, projects were solely funded by the landowners. Maintenance agreements were signed by all participants in accordance with the specific cost share venue used.

Major Work Items and Progress toward Goals

In the table below, the conservation practices completed are compared to the goals established in the original application. Each practice is then described separately.

Table : Practices, Project Goals, and Actual BMPs Implemented.

BMP	Project Goal	Total Complete
Grassed Waterways	45 acres	
Animal Waste Systems	5 units	
Grade Stabilization Structures	30 units	
Water/Sediment Control Basins	25 units	
Streambank Stabilization	9,000 feet	

Riparian buffers	30 acres	
Tree/shrub establishment	150 acres	
Timber Stand Improvement	750 acres	
Filter Strips	150 acres	
Contour buffer strips	200 acres	
No-till incentive	2,500 acres	0

Reduction in Sediment Delivery

The pre-project estimated sediment delivery, considering existing catchments, was calculated by the IDNR using Geographic Information system technology. Cropping and Practice factors considered in the RUSLE equation were adjusted after the land use assessment was completed. The data was merged with the soils information, and the final product was a series of maps that provide graphic representation of estimated sheet and rill erosion levels and sediment delivery for the Farmers Creek Watershed. Pre-project maps can be found in the appendices of this report.

Based on the 2005 GIS information, sediment delivery was estimated to be 13,623 tons/year, or 0.45 tons/acre/year. In order to meet the project goal of reducing sediment delivery by 40 percent, implemented management practices would need to reduce delivery by 5,449 tons/year. The watershed project used the Iowa Sediment Delivery Calculator, a GIS-based model, to estimate the impact of BMPs in reducing the delivery of sediment and phosphorus to the stream. As of spring 2009, 41% reduction was achieved.

Notable Achievements

IOWATER grant received

A grant of \$828, earmarked for water quality improvement and protection projects, was awarded to the Farmers Creek Watershed Project in February 2006. The funds were used to intensify water sampling efforts by paying for bacterial and nutrient tests. The grant also allowed for the purchase of water quality supplies and equipment, such as hip boots, nets, and buckets.

WIRB grant received

A grant for \$28,738 was awarded to the Farmers Creek Watershed Project by the Watershed Improvement Review Board in February of 2006. The WIRB project was designed to install practices that would keep cattle from having direct access to the stream. Funding was provided to pay for alternative watering sources and exclusion fencing. This project resulted in the installation of 5 cattle approaches and exclusion sites, a solar pump for rotation grazing, and 1,700 feet of exclusion fencing.

2006 Outstanding Watershed Project Award

The Farmers Creek Watershed Project was presented with the Outstanding Watershed Award by the Conservation Districts of Iowa, receiving a \$1,500 check. It was awarded at CDI's annual business meeting held in November 2007. The project received the

award for having installed over 60 individual BMPs in the watershed and implementing a diverse education campaign.

Mussel Seeding

In a first for Iowa, 847 mussels grown in Wisconsin by the US Fish and Wildlife service were tagged and seeded into Farmers Creek in 2007 to help improve water quality by re-introducing the bivalve population. In a follow-up survey conducted in the summer of 2008, three tagged specimens were recovered and released. Considering the nature of the mussel habitat, the DNR staff conducting the survey was pleased with the findings.

Stream Naming Project

In an effort to stretch the message of improving water quality beyond the borders of the watershed area, a public relations campaign aimed at the entire county was initiated. The purpose of the project was to identify the names of all 42 plus streams in the county and eventually put road signs up to identify their location, all in an effort to foster “ownership” of the streams by local residents. Once landowners become familiar with the streams, they begin to increase their protectiveness of that water body. This project resulted in over seven public organizations requesting our power point presentation “Streams of Jackson County”, and “place maps”, placemats with the stream map on one side and histories of the stream names on the other. These placemats were used at several big public events and local restaurants. The resulting responses from this project were overwhelming.

Problems Encountered

Unreliable Cost Share Resources

With the increasing expenses involved with constructing conservation practices, the availability of cost share has become even more of an incentive to the producer than before. In many cases, the need to piggyback watershed funds with federal EQIP dollars becomes obligatory. The floating nature of the EQIP program makes planning difficult, resulting in some projects being delayed until the following fall or spring, and sometimes a full year.

Contractor Availability

Large scale projects that require area engineers for design and layout work are often delayed due to the high work load of area staff, resulting in frustration on the part of the producers. When designs and cost estimates are not completed in time for EQIP rankings, this can put the project off by yet another year. The availability of local contractors to do the work also seems to be a limiting factor towards progress.

Weather

Weather was not a critical issue during the first several years of the project, but the severe winter of 2007-2008 followed by statewide flooding of 2008 made it difficult to get anything accomplished that year. The heavy snow cover of the 2008-2009 winter made it difficult to even look at proposed work, again postponing some projects because they will not have estimates that coincide with EQIP availability.

Conclusions

The efforts to improve the water quality in Farmers Creek by the watershed project can be evaluated by assessing the progress made in each of the objectives set forth in the original grant application. The evaluation of these four objectives is as follows:

- **Reduce sediment delivery to the stream by 40 percent.**
As previously stated in the “Reduction in Sediment Delivery” section of this paper, it is estimated that the sediment delivery was reduced by 41%, exceeding the 40 percent goal of the project. Given the high level of support and interest from landowners, it can be said that the percentage of sediment delivery may decrease even further, as conservation inputs will likely continue after the project ends.
- **Reduce the amount of nutrients delivered to the stream by 40%**
According to the Cumulative Loading Reductions for Phosphorus, which are calculated on the project spreadsheet and based on sediment reductions, the project reduced Phosphorus loading by 5870.7 pounds per year. Unfortunately, there was no baseline established at the start of the project, so there is no reliable data available to determine what the percentage reduction actually is, especially for nitrates. Using the estimated 14,434 tons per year sediment delivery and multiplying by 1.3, phosphate delivery would calculate out to 18,764 pounds per year, translating into a 31 percent reduction in that nutrient. With 40 percent as the target, the project did a respectable job of reducing the phosphates.
- **Provide information and education to the landowners and stakeholders concerning water quality issues.**
As detailed in the “Information and Education” section of this report, conservation practices and cost share information were promoted before and after these practices were applied to the land. A variety of public relation methods were utilized, using direct and personal mailings and phone calls to broad outreach efforts making use of newspaper features, field days, and radio shows. Considering the high number of conservation practices that were achieved by the project, it must be assumed that the information/education efforts were successful.
- **Water quality monitoring will be conducted.**
As stated in the Water Quality Monitoring section, monitoring of the stream’s waters were conducted for the life of the project, and no significant problems were found to have occurred.

Recommendations

Cost Share Piggy-Backs can limit progress

Although piggy-backing 319/ WSPF with EQIP funding is an advantage in that it can greatly stretch the amount of money available for conservation practices, there are drawbacks.

One drawback involves piggy-backing of expensive practices, such as stream bank stabilization, where the Farmers Creek Watershed project was required to utilize

EQIP funds. Due to the limited EQIP funds and the low ranking of the stream bank practices, it was almost impossible to get these projects funded.

The second drawback involves timing the EQIP ranking period with the construction season. A producer may want to put conservation practices on his farm, but may have to wait for the next year's EQIP, and hope that he gets through the ranking. Depending on the time of year that the EQIP contracts are signed, the producer may have to wait another six months to a year for the next best construction season. If it wasn't for 319/WSPF funding, very few projects would have been completed if they had to rely on EQIP funding alone.

Good public relations are vital for watershed project success

A comprehensive information and education plan is the

Soil Technician cooperation is key to success

The Farmers Creek Watershed project managed to implement over 70 individual conservation practices during the five year run. The vast majority of these projects could not have been accomplished without the aid of the NRCS soil technician in the office. The biggest problem with project plan designs are with those that need to go to the area office. The turn-around time from engineering request to final plans can take many months, to the frustration of the landowners.

LAKE HENDRICKS WATERSHED PROJECT

Annual Report

Project Name: Lake Hendricks Watershed Project

Project Number: 045-4.09

Soil and Water Conservation District: Howard

Reporting Period: July 1, 2009 – June 30, 2010

Reporting Individual: David Puffer, Project Coordinator

Information/Education

- Plan and conduct quarterly meetings with the Lake Hendricks Advisory Committee (LHAC)
- Build the informational Kiosk at the main entrance to the park.
- Develop 6 Public Service Announcements (PSAs)
- Plan a field day for the design and function of various BMP's. (Tile Filter, Grade Stables, etc.)
- Attend periodic City of Riceville and CCB meetings to promote project and seek partnerships.
- Place signs at various BMP sites that describe the design and function of the practice.
- Submit a monthly article to the newspapers on the progress of the BMP's.

Information/Education Activities Conducted:

1st qtr:

- 1. I gave a Power Point presentation to the Riceville Community Club on the progress of the project.**
- 2. We had two meetings with the Advisory Committee (LHAC).**
- 3. I Attended a City of Riceville meeting to discuss the project.**
- 4. We built one of two informational Kiosks.**
- 5. The Lake Hendricks Project had 3 articles in the Riceville Recorder describing the various BMP's.**
- 6. We had a field day at the Lake Hendricks with representatives from Iowa State on the implementation and benefits of Bio-Reactors.**

2nd qtr:

- 1. I gave a Power Point presentation to the Howard County Conservation Board to discuss the built practices and the schedule for next year.**
- 2. I gave a Power Point presentation to the Riceville High School to explain the project and answer any questions. The presentation was also geared to promote interest for the students and families in the Riceville area.**
- 3. We had a meeting with the Advisory Committee (LHAC).**
- 4. I attended the Riceville Community Club to answer any questions and to discuss the progress of the project.**
- 5. 2 articles in the Riceville Recorder regarding the project.**

3rd qtr:

- 1. We had a meeting with the Advisory Committee to discuss potential future projects.**

2. Finished the design for the educational signs to be placed at the practice sites.
3. I attended the Howard County City Council meeting to discuss the progress of the Lake Hendricks Project.
4. I attended the Community Club meeting in Riceville to talk about the upcoming construction season.
5. 2 articles in the Riceville Recorder newspaper describing the practices that have been built out at the lake.

4th qtr:

1. I had a meeting with Jeff Tisl and Kyle Ament regarding future practises for Lake Hendricks.
2. Conducted a field day at Lake Hendricks for the instalation of a Bio-Reactor.
3. I gave a Powerpoint Presentation to the Riceville Community Club for the completed practises for 2010.
4. Field day at Lake Hendricks with representatives from the DNR, EPA, and IDALS to tour the progress of the project and completed BMPs.

Assessment and Evaluation

- Continue certain aspects of the on-going monitoring program to establish better pre-implementation water quality values in order to compare progress
- Continue to support DNR-led in-lake vegetation study
- Work with DNR & CCB to develop timber management plan for CCB land surrounding the lake.
- Evaluate the BMP's during and after construction.
- Complete sediment calculations for all BMP's completed

Assessment and Evaluation Activities Conducted:

1st qtr:

1. Continued water sampling on 12 sites, twice a month.
2. Continued to work with Howard County Conservation on T.S.I.
3. We continued discussions with the county to determine the best approach for additional BMP's.
4. I had an in-field meeting with Dr. Helmers from Iowa State to determine the size and placement of the Bio-Reactor.
5. I had an in-field meeting with a landowner on the implementation of a CP33 (Filter Strip) bordering the east side of the lake.

2nd qtr:

1. Continued water sampling on 12 sites, twice a month.
2. Meetings with the County Conservation Board and the contractor to discuss the implementation of various practices adjacent to the lake.

3. Field visit with George Schaefer (area engineer) to look at areas for potential practices.
4. Complete assessment of gullies surrounding the lake. The assessment included the tracking of all gullies via GPS points the length of each gully and mapping of these points.
5. Worked on Drainage Area slopes and RCN's for the Wetland as well as 2 Grade Stabilization Structures.

3rd qtr:

1. We took soil samples out at the proposed wetland sites to determine the possibility of a sheet pile structure.
2. We evaluated a site for a potential Grade Stabilization Structure.
3. Worked on drainage areas for other BMP's within the lake.
4. I surveyed 2 sites for potential BMP's.

4th qtr:

1. Surveyed completed practises at Lake Hendricks.
2. Worked on DNR and Army Corps permits for the future wetland.
3. Surveyed two additional future BMP sites.
4. Completed the final check-out survey with George Schaefer (area engineer) for Grade Stabe number 3.
5. Continued water sampling at the 12 sites.
6. Worked on the implementation of TSI number 3.

Miscellaneous Activities

Miscellaneous Activities Conducted:

1st qtr:

1. I attended S.W.I.M training at Springbrook (July 7th, 8th,9th)
2. I participated in the Wisconsin Public Service banquet and received a \$2,000.00 check for the project
3. I set up a booth about the project at the Agriculture Festival.

2nd qtr:

1. Attended the Ducks Unlimited banquet to promote the project.
2. I conducted a field day with small groups to discuss the different practices and the benefits of those practices.
3. Made a template for signs that describe the various practices by definition as well as the purpose of the practice.

3rd qtr:

1. I attended the Iowa Soybean Association Meeting.

2. I attended the Chester Ducks Unlimited banquet to promote the project
3. Went to Mason City to attend a DNR (319) meeting.
4. Went to Independence to attend the NE Iowa coordinators meeting.
5. I attended a structure training meeting.
6. I went to Iowa State to attend a conservation meeting.
7. I attended the Chester Pheasants Forever banquet.
8. I attended the Turkey River Pheasants Forever banquet.

4th qtr:

1. Attended a meeting with Leah Medley (EPA watershed division) to discuss the success of completed practices at Lake Hendricks.
2. Worked on phase 2 plan for the lake.
3. Worked on FY 2011 budget and work plan.
4. Attended a contractor's and engineer's meeting for the implementation of Grade Stabe number 3.

Practices

- Work with various USDA programs to promote upland BMPs
- Complete a detailed survey of CCB land on which multiple wetlands will be built in FY10
- Start construction of BMP's (Tile Filter, Grade Stabe, Water/Sediment Basins).

	No. Acres or units	Total Cost	Cost Share Rate	Land owner Cost	Project Cost	319, WPF, WSPF	Other Source	Other Source ID
Practices:								
No-Till Incentive	20	\$520.00	(4)	0	\$520.00	\$520.00	0	
Manure Mgt Incentive	35	\$630.00	(6)	0	\$630.00	\$630.00	0	
Conservation Tillage	35	\$583.00	(5)	0	\$583.00	\$583.00	0	
Grassed Waterways	2 acres	\$2,667.00	(8)	\$517.00	\$2,150.00	\$1,250.00	\$900.00	CRP
Tile Filter	1	\$12,000.00	75%(9)	\$3,000.00	\$12,000.00	\$9,000.00	0	
Water/Sediment Basins	2	\$24,000.00	75%(9)	\$6,000.00	\$24,000.00	\$18,000.00	0	
Grade Stab Structures	2	\$35,000.00	75%(9)	\$12,500.00	\$35,000.00	\$22,500.00	0	
Streambank Stabilization	500 feet	\$12,500.00	75%(9)	\$3,125.00	\$9,375.00	\$9,375.00	0	

Timber Stand Improve	50 acres	\$3,750.00	75%(9)	\$938.00	\$2,812.00	\$2,812.00	0	
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- (1) \$30/ac for a 3-year commitment, \$20/ac for a 2-year commitment
- (2) \$20/ac for a 3-year commitment, \$10/ac for a 2-year commitment
- (3) \$18/ac for a 5-year commitment
- (4) \$10/ac for a 5-year commitment
- (5) 75% via the project for those waterways ineligible for CRP, otherwise 90% via the USDA CRP
- (6) Since the CCB is the landowner, this practice would not rank well for EQIP; therefore the project will offer 75% in cost share, all from 319/WSPF/WPF

Practice Activities Conducted:

1st qtr:

- 1. We surveyed and began construction on 500ft of Streambank Stabilization.**
- 2. We began construction on the Grade Stabilization structures.**
- 3. Started construction on the Bio-reactor.**

2nd qtr:

- 1. Completed the construction of 485 ft of Streambank Stabilization.**

3rd qtr:

- 1. Completed the construction of a 510ft Grade Stabilization Structure with 2.5 acres of pooling area.**
- 2. Completed the construction of a 160ft Grade Stabilization Structure with .5 acres of pooling area.**
- 3. Completed the construction of a 55ft long by 8ft wide by 3ft depth Bio-Reactor.**
- 4. Signed contract with a landowner for 23 acres of CP33 (Habitat Buffer) bordering the east side of the lake.**
- 5. Signed contract with a landowner for 16.8 acres of CP38 (Gaining Ground Buffer) bordering the east side of the lake.**

4th qtr:

- 1. Completed the construction of a 260 foot Grade Stabe structure with 1 acre of pooling area.**
- 2. Completed the ground preparation and seeding of 47 acres of native grasses.**
- 3. Started the implementation phase of TSI number 3.**

485ft of Streambank Stabilization Structure.



Completed a 500ft long Grade Stabilization Structure that will treat 3 tile outlets and prevent approx. 350 t/y of sediment delivery to the lake. The pond is approx 2.5 acres in size.



Surveyed and constructed a Grade Stabilization Structure that will treat 1 tile outlet and prevent approx. 52 t/y of sediment from entering the lake.



Completed the installation of a Bio-Reactor that will treat one tile outlet and filter out nitrates from the field bordering the lake.



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Construction of Grade Stabilization structure number 3.



23 acres of CP33 with an additional 16.8 acres of CP38.



APPENDIX B

LIST OF AGENCY COOPERATORS

State Lead Agency

Iowa Department of Natural Resources
Stephen Hopkins, Nonpoint Source Coordinator – 515/281-6402

Other State Agencies

Iowa Department of Agriculture and Land Stewardship/Division of Soil
Conservation
Chuck Gipp, Director – 515/281-6146

Federal Agencies

Environmental Protection Agency
Karen Flournoy – 913/551-7782

Natural Resources Conservation Service
Rich Sims, State Conservationist – 515/284-6655

Local Agencies

The individual project summaries, found on GRTS, identify local partners and other state and federal agencies which support each project.

APPENDIX C

FINANCIAL STATUS

Iowa's FFY2010 Section 319 grant was awarded \$4,417,800. Of this total, \$2,127,300 was awarded to projects under the Base Funding guidance, and the remaining \$2,290,500 was awarded to projects under the Incremental Funding guidance. The following identifies the projects and funding levels awarded:

Base Funding	
State NPS Program Implementation and Technical Assistance	943,954
Monitoring for 319 Projects	50,000
Statewide Mussel Survey	253,060
Community Assessment Tool Development/Training	158,000
Small Open Feedlot Strategy	100,000
Iowa Learning Farms Project	196,826
TMDL	425,460
TOTAL BASE	2,127,300
Incremental Funding	
TMDL	458,100
Dry Run Creek	521,260
Lake Geode	470,761
Lyons Creek	455,770
Carter Lake	384,609
TOTAL INCREMENTAL	2,290,500

Iowa's match is provided through programs administered by the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation. These programs and a brief description of each include:

Commented [R710]: This needs to be updated, not all of these programs are eligible for 319 Match

Water Protection Fund - Projects and Practices

The state Water Protection Fund provides funding to county soil and water conservation districts to carry out projects to protect surface and ground waters from point and nonpoint sources of pollution. Overall responsibility for administration of the Water Protection Fund programs and funds is assigned to the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (DSC). Water Protection Funds currently are provided through the state Resources Enhancement and Protection (REAP) Program.

The DSC has worked closely with the Department of Natural Resources and with other state and federal resource agencies in selecting projects to be funded, with many projects receiving funding from both the Water Protection Fund and from other programs, such as EPA's Section 319 Program. Since 1992, DSC and DNR have jointly solicited proposals for both the Water Protection Projects and the Section 319 Nonpoint Pollution Control programs, and have utilized a common procedure for review of those proposals.

A portion of the REAP soil and water enhancement funds are used for conducting Water Protection Projects, with 50% of the allocation being used for such projects. The remainder of the REAP soil and water allocation is used to support the Water Protection Practices Program being carried out by county soil and water conservation districts. One and one-half percent of the allocation is held in a reserve fund, and the balance is divided equally among the 100 SWCDs.

In SFY2010, the WPF allocated approximately \$1,800,000 to projects.

Publicly Owned Lakes Program

The Publicly Owned Lakes Program (POLP) is a component of the Iowa Financial Incentives Program, which provides financial assistance to owners and operators of farmland for installation and use of soil and water conservation practices. The POLP is used to cost share up to 75% of the approved cost of permanent soil conservation practices installed in watersheds of selected publicly owned lakes and reservoirs. POLP funding is administered by the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship (DSC).

The publicly owned lakes or reservoirs eligible for POLP funds are identified on a priority list established annually by the DNR, using the following criteria:

- Any constructed or natural lake having a watershed acreage to lake surface area ratio of less than 80 to 1 and is owned by an Iowa state, county or municipal government.

- A map of the watershed identifying the sources of significant sediment delivery to the lake.
- Documentation of the existence of a watershed plan that targets significant sources of sediment delivery to the lake.

POLP funds may only be used to cost share permanent soil conservation practices. Eligible practices include: critical area planting, diversions and terraces, grade stabilization structures, grassed waterways, and water and sediment control basins. Practice installation is subject to the same general administrative requirements as apply to the state's voluntary cost share program, including entering into a long-term maintenance agreement with the SWCD.

In recent years, Iowa has utilized POLP program funds in combination with funding from other programs in a number of lake watershed projects, including funds from EPA's Section 319 programs.

In SFY2010, the POLP was allocated approximately \$350,000 and the following lake watersheds were selected:

- Big Creek Lake, Polk and Boone Counties
- Lake Geode, Des Moines and Henry Counties
- Hawthorn Lake, Mahaska County
- West Lake, Clarke County
- Williamson Pond, Lucas County
- Windmill Lake, Taylor County

Iowa Watershed Protection Fund

The Iowa Watershed Protection Fund (WSPF) is administered by the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation, (DSC). The WSPF was established to accelerate watershed protection efforts in the state. The authorization for these funds is broader than for the Water Protection Fund (WPF) or Section 319 funding. Primary goals include building the capacity of a growing number of local communities to sponsor watershed protection efforts, and providing resources to leverage other funding available at the federal and local level.

This program received an appropriation of \$2.55 million to develop and encourage integrated approaches to meet multi-objective water quality protection, flood control, erosion control, recreation, wildlife habitat and other resource protection issues. It provides funding for watershed solutions to water quality and water management problems that impact local communities, the state, and the country.

A portion of this funding directly supports watershed protection project implementation. In addition to funding project implementation, WSPF provides matching funds with the Iowa DNR to support to SWCDs in the development of projects and project applications. Using funding of the Development Grants, sponsors are provided additional resources to

investigate and assess a potential project and to complete the necessary paperwork to submit an application.

In SFY2010, the WSPF allocated approximately \$6.1 million to Development Grants and projects.

Iowa Watershed Improvement Review Board

The Watershed Improvement Review Board (WIRB) was established in 2005 by the Iowa Legislature to provide grants to watershed and water quality projects. The Board is comprised of representatives from agriculture, drinking water and wastewater utilities, environmental and conservation organizations, agribusiness, and two state senators and two state representatives. (Iowa DNR participates with a member on the Board.) The Governor appoints the representatives of the identified groups, organizations and agencies. Administrative support for the Board is provided by the Iowa Department of Agriculture and Land Stewardship/Division of Soil Conservation.

IDNR supports the development of many potential WIRB funded projects through the support of the 3 Regional Coordinators, who assist project sponsors in developing project applications, and by providing GIS technical support. In addition, many projects are using WIRB funding in conjunction with Section 319/WSPF/WPF to provide support for a broader, more comprehensive project, addressing a variety of water quality issues within a specific watershed.

Funding provided to the Board was \$5 million in SFY2010. Additional information regarding the Board and funded projects can be found at <http://www.iowaagriculture.gov/IWIRB.asp>

Lake Restoration

The DNR Lakes Restoration Program, administered through the DNR Fisheries Bureau, provides funding to complete diagnostic and feasibility (DF) studies for planning lake restoration activities on priority lakes. The DF studies are conducted by the Iowa State University Department of Ecology, Evolution, and Organismal Biology, by private consultants, or by private nonprofit organizations. A component of the studies includes nutrient data both in the watershed and in-lake.

DF studies are currently underway for the following lakes:

- Blackhawk Lake
- Lower Gar Lake
- Minnewashta Lake

- Upper Gar Lake
- Lake Manawa
- Hickory Grove Lake
- Blue Lake
- Little Storm Lake
- Lost Island Lake

Other lake water quality studies are underway for:

- Rathbun Reservoir – Army Corps of Engineers Section 1135 Program Shoreline Protection/Wetland Construction Project
- Ventura Marsh – Army Corps of Engineers Section 206 Aquatic Restoration Project

DF studies were recently completed for the following lakes, which are currently undergoing lakes restoration activities funded by the DNR Lakes Restoration Program:

- Green Valley Lake
- Lake Darling
- Prairie Rose Lake
- Lizard Lake

DNR Lakes Restoration program and the DNR ambient monitoring program are co-funding aquatic vegetation surveys of 13 Iowa lakes, conducted by Iowa State University researchers. The aquatic vegetation surveys will complement nutrient monitoring of the lakes. Local DNR Fisheries staff will collect water samples for nutrient analysis from both the littoral zone and deep spot sites in the following lakes:

- Lake Ahquabi
- Lake Anita
- Greenfield Lake
- Meadow Lake
- Mormon Trail Lake
- Swan Lake (Carroll County)
- Lake Wapello
- Silver Lake (Delaware County)
- Lake Hendricks
- Smith Lake (Kossuth County)
- Pleasant Creek Lake
- Red Haw Lake
- Lake of Three Fires

The DNR Lakes Restoration 2008 annual report and 2009 plan are available online at: <http://www.iowadnr.gov/water/lakerestoration/files/08report.pdf>

State Revolving Funds

Commented [R711]: Is this listed under Match programs? Am I missing something or aren't these federal funds?

The State Revolving Fund (SRF) is one of Iowa's primary sources for investments in water quality and protection of public health. Two funds, for drinking water and for water pollution control, have provided low-cost financing worth more than \$1.5 billion to Iowa communities, farmers, watershed groups, and others. The Iowa SRF is operated through a partnership between the Department of Natural Resources (DNR), and the Iowa Finance Authority (IFA). DNR administers the environmental and permitting aspects of the programs, with IFA providing financial assistance including loan approval and disbursements.

The SFY 2010 total included:

- \$186 million to design and construct wastewater treatment upgrades, sewer rehabilitation, combined sewer overflow correction, and new collector and interceptor sewers.
- \$100 million to design and construct water treatment, storage, and water supply projects;
- \$23 million for nonpoint source projects to prevent soil erosion, manage manure, replace inadequate septic systems, improve storm water management, and conserve land for water quality and habitat protection.
- \$28 million for green projects that will result in increased water efficiency, save energy, and restore natural hydrology and improve water quality. Of this amount, \$5 million was provided as loan forgiveness through the ARRA funding. These projects ranged from \$172,000 for a more energy efficient wastewater aeration system in Maquoketa to an \$8.7 million effort to install high tech water meters in Dubuque.

The complete 2009 SRF annual report can be accessed at:
<http://www.iowadnr.gov/water/srf/files/2010report.pdf>

APPENDIX D

GIS ASSESSMENT AND TOOLS

Geographical Information Systems (GIS) support was provided through two staff assigned to the DNR. Watershed GIS activities were conducted on 15 waterbodies (including work for Section 319 funded projects, DSC watershed projects, and/or TMDL projects). Typical GIS support to watershed projects include assisting with assessments (land cover, stream and gully), analyzing data, and providing outputs used to target high priority areas to address impairments.

Land Cover/Soil Loss/Sediment Delivery Assessments

Watershed assessments using tablet computers are used to collect land cover, tillage, crop residue, and management information for priority watersheds. Using the land cover information and the RUSLE soil loss equation sheet and rill erosion maps are created representing the amount of soil erosion occurring in a watershed. The equation takes into account land cover and management, slope steepness, slope length, soil erodibility, and rainfall. Sediment delivery maps are created from the sheet and rill data taking into account such factors as the watershed's landscape position, size of the watershed and watershed shape. Additionally, any practices (i.e. terraces, waterways, filters, sediment control structures) installed are given an appropriate sediment reduction credit based on their trapping efficiencies. The sediment delivery maps are used to estimate the amount of sediment reaching the outlet of a watershed and to target "hot-spots" for targeted conservation practices. See maps 1-3 for example.

Stream Assessments

The stream assessment procedure, entitled RASCAL (Rapid Assessment of Stream Conditions Along Length), was developed in 2006 and refined in 2007 to inventory in- and near-stream characteristics such as bank erosion, substrate, aquatic habitat, riparian cover, livestock access and more. The procedure requires watershed project personnel to walk the length of stream being assessed and note conditions using a GPS equipped PDA. When complete, the data and resulting maps are used to identify possible areas for targeted BMP implementation. See map 4 for example.

The following is a list of variables that are assessed during a typical survey:

<i>Flow Condition</i>	<i>Bank Height</i>
<i>In-Stream Habitat</i>	<i>Stream Bank Stability</i>
<i>Substrate</i>	<i>Percent Bare Bank</i>
<i>Embeddedness</i>	<i>Bank Vegetation</i>
<i>Livestock Access</i>	<i>Stream Bank Material</i>
<i>Channel Condition</i>	<i>Riparian Zone Width</i>
<i>Pool Frequency</i>	<i>Riparian Zone Cover</i>
<i>Riffle Frequency</i>	<i>Adjacent Land Cover</i>
<i>Canopy Cover</i>	<i>Channel Pattern</i>

Also points of interest are noted during the assessment, they can include:

<i>Beaver Dam</i>	<i>Confluence</i>
<i>Boating Access</i>	<i>Construction Activity</i>
<i>Bridge</i>	<i>Culvert Stream</i>
<i>Concrete/Rock Waste</i>	<i>Dam/Barrier</i>

Dead Animal
Drainage Ditch
Drums/Barrels
Fence Across Stream
Gully Minor
Gully Severe
Knick Point
Manure
Metal/Cars
Other
Seep
Sink

Dead Fish
Sinkhole
Spring
Storm Sewer
Stream Xing (Animal)
Stream Xing (Machinery)
Suspicious Activity
Tile Outlet
Trash- Other
Unknown
Wastewater

Gully Assessments

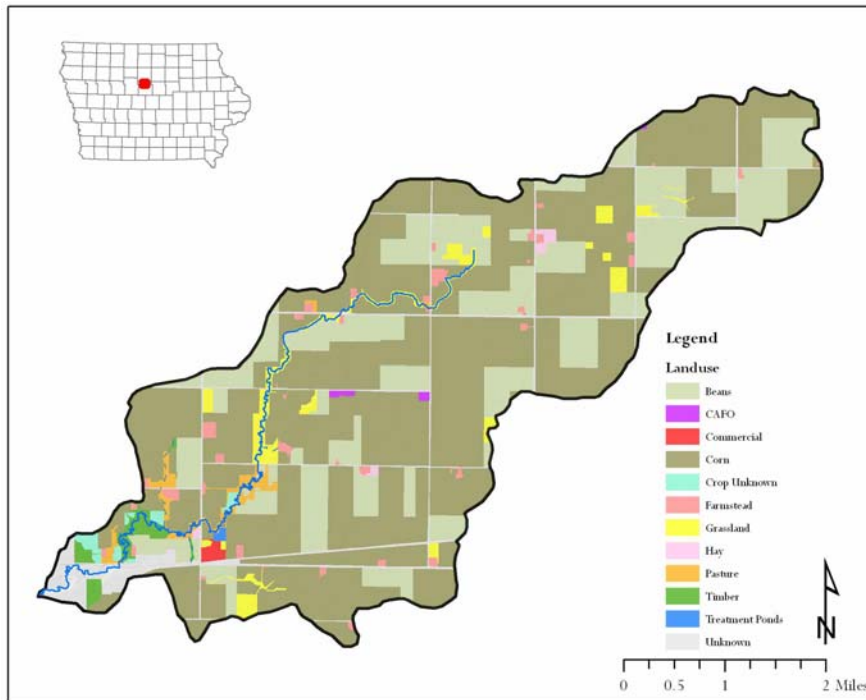
Gully erosion has become an area of focus for some of Iowa's watershed projects. During FY07 an assessment tool similar to the RASCAL was developed to assess erosion from classic gullies. The assessment tool collects gully length, depth, recession rate, and location data. The resulting data is used to quantify sediment loading from specific locations as a means to identify and target gullies contributing high amounts of soil to priority waterbodies. See map 5 for example.

Dead Animal
Drainage Ditch
Drums/Barrels
Fence Across Stream
Gully Minor
Gully Severe
Knick Point
Manure
Metal/Cars
Other
Seep
Sink

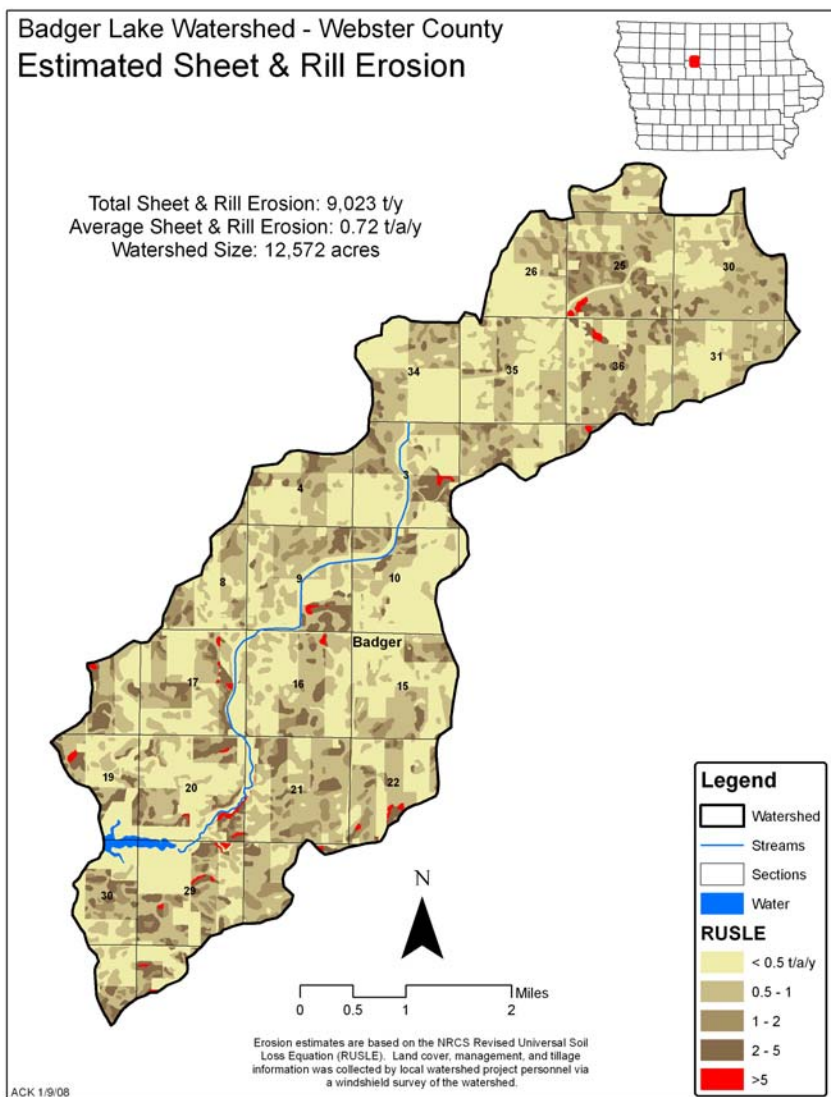
Dead Fish
Sinkhole
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Stream Xing (Animal)
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Suspicious Activity
Tile Outlet
Trash- Other
Unknown
Wastewater

Gully Assessments

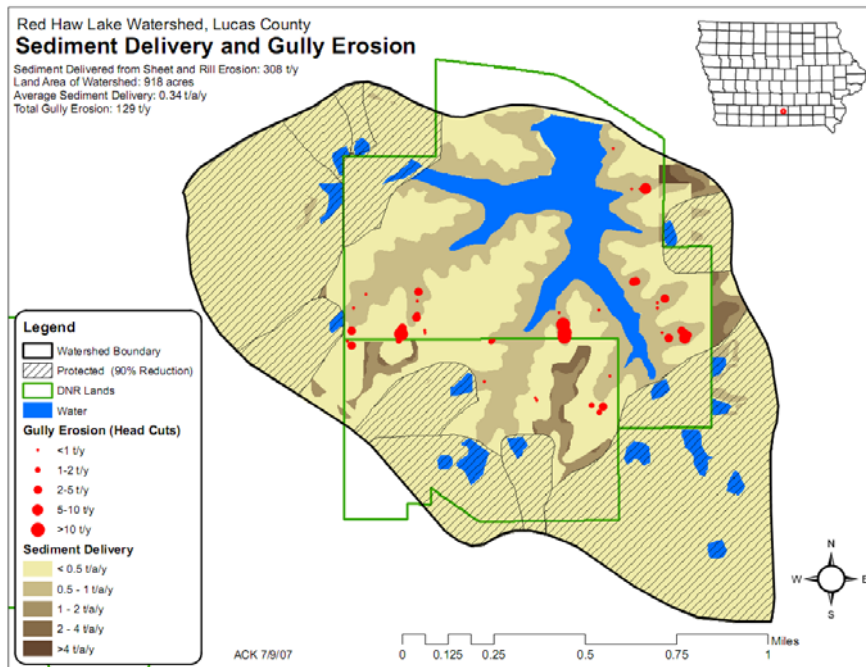
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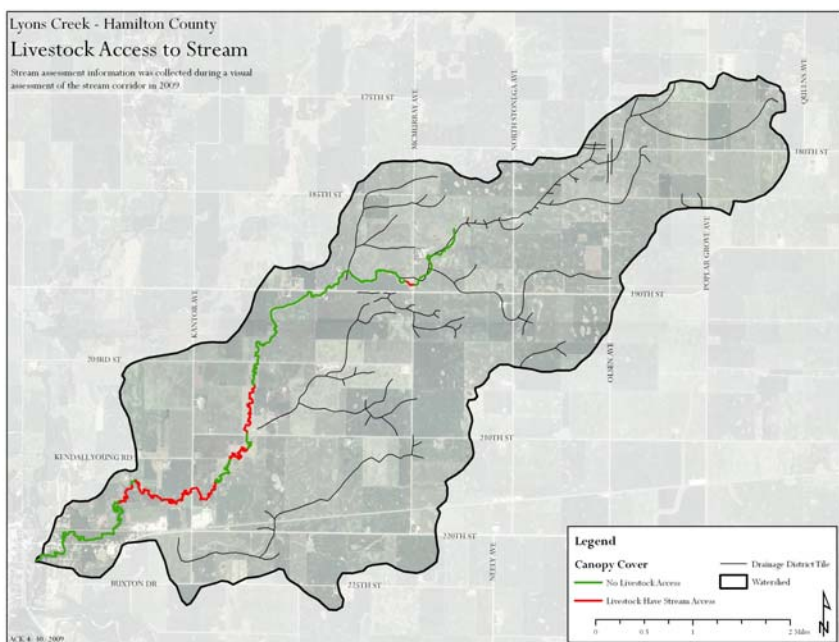
Map 1. Example of land cover data for the Lyons Creek Watershed (Hamilton County).

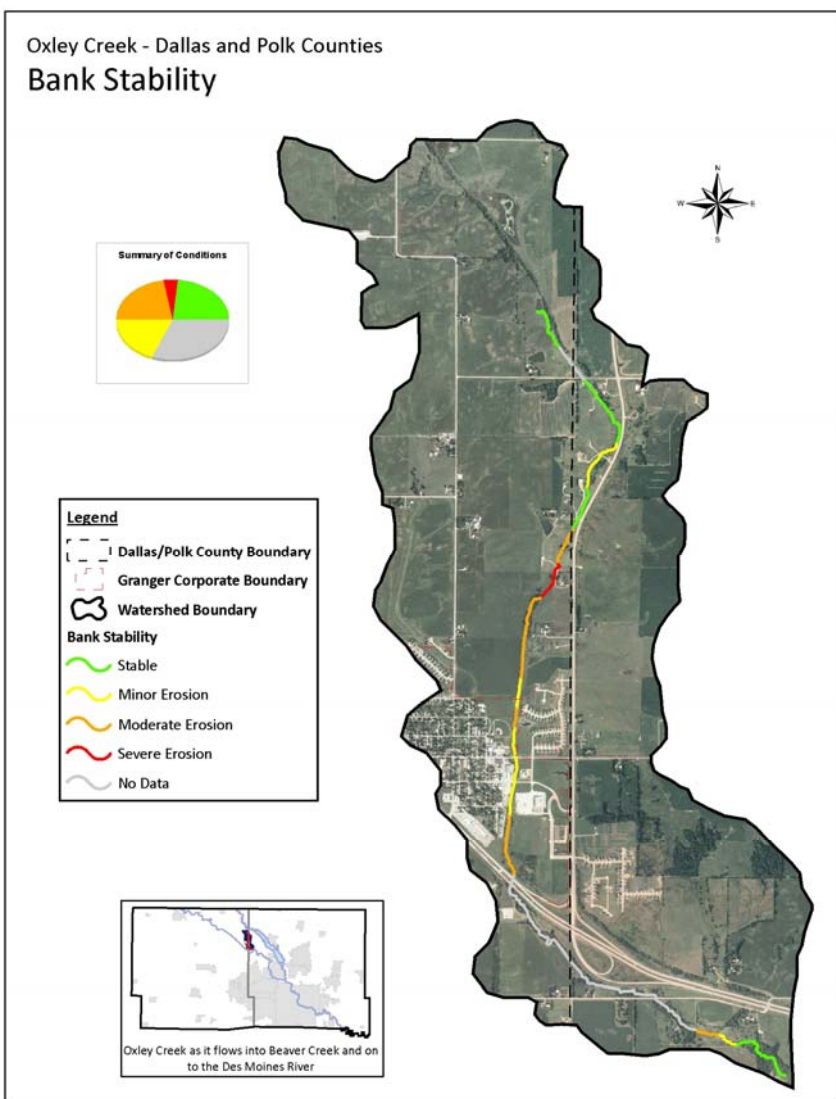


Map 2. Example of sheet and rill erosion data for the Badger Lake Watershed (Webster County).

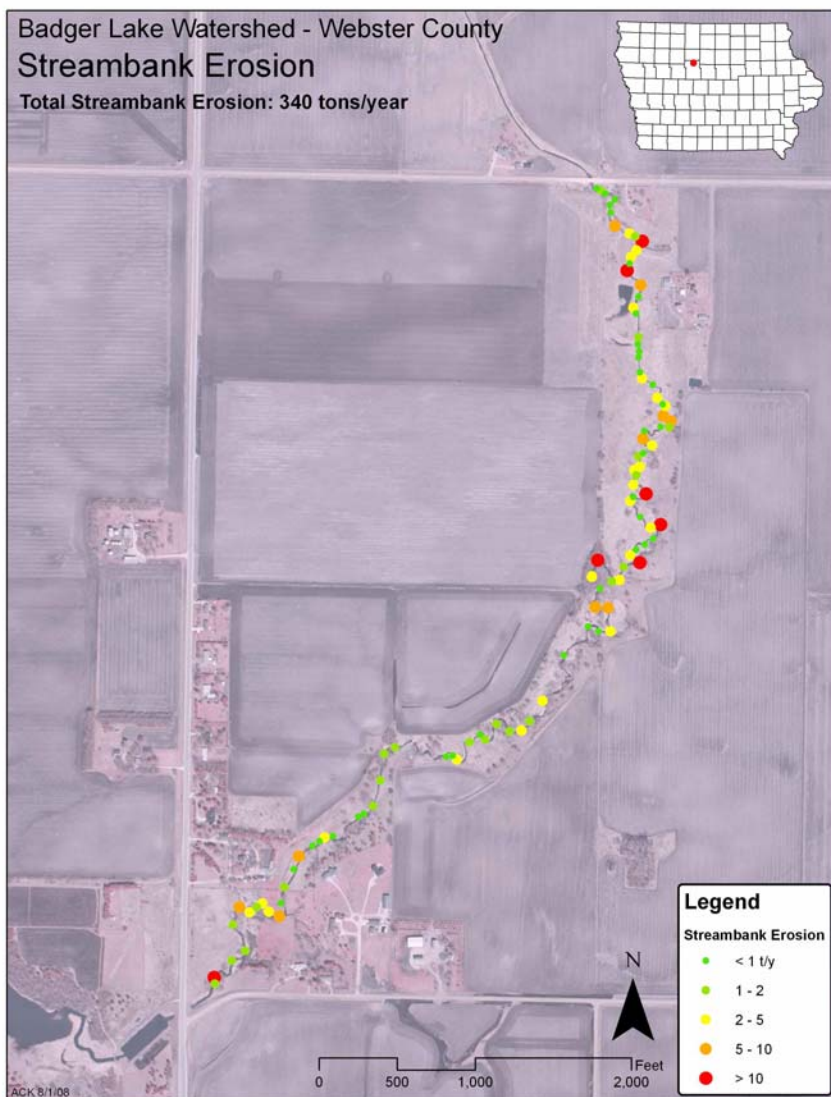


Map 3. Example of sediment delivery data for the Red Haw Lake Watershed (Lucas County).





Map 5. Example of bank stability data resulting from the RASCAL stream assessment of Oxley Creek (Polk County).



Map 6. Example of bank erosion data resulting from the RASCAL stream assessment of Badger Creek (Webster County).